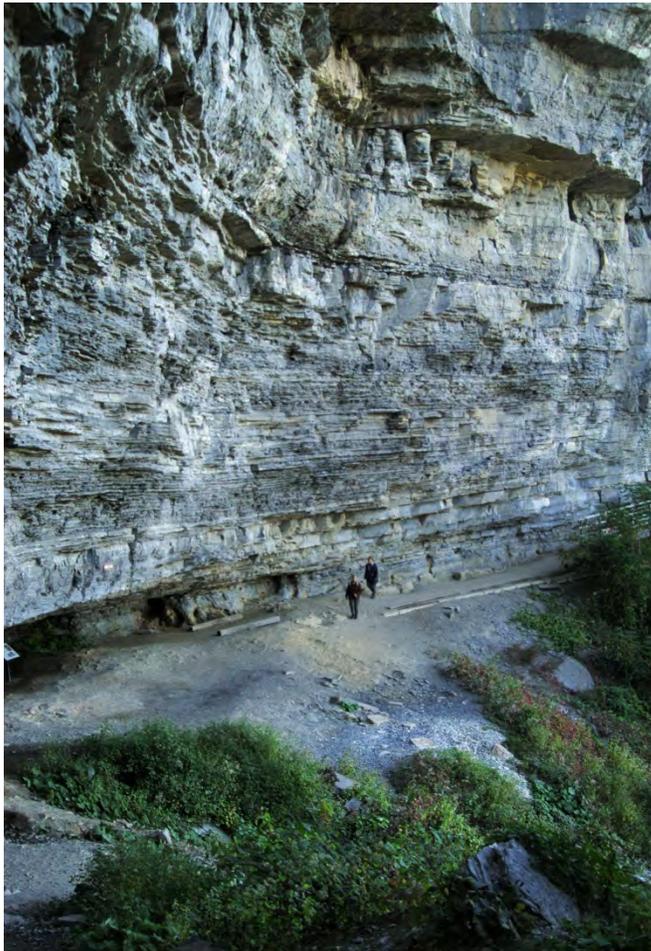


John Boyd Thacher State Park Master Plan

Albany County
Towns of Knox, Berne, New Scotland and Guilderland

Final Environmental Impact Statement

November 13, 2013



Andrew M. Cuomo
Governor

Rose Harvey
Commissioner



SEQR
NOTICE OF COMPLETION OF A FINAL EIS

Date of Notice: November 13, 2013

Lead Agency: New York State Office of Parks, Recreation and Historic Preservation (OPRHP)

Title of Action: **Adoption and Implementation of a Master Plan for John Boyd Thacher State Park (Incorporating the former Thompson's Lake State Park)**

SEQR Status: Type I

Location of Action: John Boyd Thacher State Park is located in the Towns of Berne, Knox, Guliderland, and New Scotland in Albany County.

This Notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review) of the Environmental Conservation Law. A Final Plan and Final Environmental Impact Statement (FEIS) on the proposed action has been prepared and accepted by OPRHP. The Executive Summary of the Master Plan and FEIS describes the proposed action, the environmental setting, alternatives, potential environmental impacts and mitigation and the agency's responses to comments on the Draft Plan/DEIS.

Agencies and the public are afforded the opportunity to consider the FEIS. This consideration period ends on **November 25, 2013**. Copies of the Final Plan and FEIS are available for review at the John Boyd Thacher State Park Office; at the offices of the agency contacts; and at the following Libraries: Voorheesville Public Library, 51 School Road, Voorheesville; Berne Public Library, 1656 Helderberg Trail, Berne; and the Guilderland Public Library, 2228 Western Ave. Guilderland, NY.

The online version of the Final Master Plan and FEIS is available at the following publically accessible web site: <http://www.nysparks.state.ny.us/inside-our-agency/master-plans.aspx>

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Large format maps of the Master Plan and Trails Plan are also found on the CD Rom

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Abbreviations Used

BCA	Bird Conservation Area
DEC	New York State Department of Environmental Conservation
DOT	New York State Department of Transportation
EAWPP	Emergency Action Written Preparedness Plan
EMB	Environmental Management Bureau of OPRHP
FEIS	Final Environmental Impact Statement
IBS	National Audubon designated Important Bird Area
Nature Center	Emma Treadwell Thacher Nature Center
NCC	Northeastern Cave Conservancy, Inc.
NHA	Natural Heritage Area
NHP	New York Natural Heritage Program
NWI	National Wetlands Inventory
NYS	New York State
OPRHP	New York State Office of Parks, Recreation and Historic Preservation
SEQR	State Environmental Quality Review Act
SHPO	State Historic Preservation Office
Thacher SP	John Boyd Thacher State Park
TLSP	Thompson's Lake State Park

Conventions Used

Park Names: The master plan calls for merging John Boyd Thacher and Thompson's Lake State Parks and managing them under one name – John Boyd Thacher State Park. The campground at Thompson's Lake will now be known as the Thompson's Lake Campground at John Boyd Thacher State Park.

Executive Summary

Location and Access

John Boyd Thacher State Park and the campground are located on the Helderberg escarpment on NY 157. Portions of the park lie in the towns of Berne, Guilderland, New Scotland and Knox.

The Emma Treadwell Nature Center is located close to the campground at the northern end of Thompson's Lake on Nature Center Way (formerly Stan Levine Drive) off of Ketcham Road in the Town of Knox.

Economic Contribution

For the Saratoga-Capital District park region (which includes Thacher State Park) estimated annual economic output and business sales figures are \$249 million and 2,929 jobs created. State expenditures in the Saratoga-Capital District park region during fiscal year 2008-9 were \$47.6 million (this number includes the central administrative activities that are located in Albany) for operating expenses and \$11 million for capital expenditures. Visitor expenditures for the region in the 2007-8 season (last season this information is available) were estimated to be between \$56.1 and \$115.5 million.

Recreational Needs Assessment

The master plan identifies Albany and Schenectady counties as the service area of the park. In this service area recreational needs that equal or exceed the State average are swimming, biking, golfing, walking for pleasure, equestrian activities, camping, hiking, boating, fishing, x-country skiing, downhill skiing and snowmobiling.

Park Boundaries

The boundaries of the park and the campground are depicted in Figure 1.

Adjacent Land Uses

The surrounding land uses are predominated by agriculture, vacant and suburban rural residential classifications. (Figure 2)

Legal Considerations

There are two rights-of-way for private landowners, one easement for a land foundation, park water and sewer lines on private properties and restrictions from the NYS Department of Transportation on doing work around Route 157 through the park.

Programs and Partnerships

Most of John Boyd Thacher State Park has been designated as a Bird Conservation Area (BCA). (Figure 3)

Physical Resources

Geology and Topography

Geology is perhaps the most significant factor that lead to the establishment of John Boyd Thacher State Park. The prominent cliff of the Helderberg Escarpment that runs through the park and to the

south attracted the public, geologists, and paleontologists for a century before Emma Treadwell Thacher donated lands to the State of New York, a legacy of her husband's effort to preserve the cliffs from development. (Ver Straeten, 2012) (Figures 4 and 5)

The escarpment is also the most significant topographic feature of Thacher Park, averaging 100 feet in height the cliffs dominate the parks' and the area's landscape. Fracturing of the bedrock exists on the escarpment.(Figure 6)

Soils

The soils at John Boyd Thacher State Park are mainly made up of those derived from the limestone, sandstone, shale and siltstone of the parent glacial till material. In these soils, depth to bedrock ranges between 0 to 20 inches with common exposed bedrock outcrops. Descriptions of the soils and their limitations for certain kinds of development are detailed in Appendix C.

Water, Watersheds and Wetlands

The park is in several sub-watersheds of the Mid-Hudson watershed. Many types of water resources ranging from lakes to wetlands exist within the park. The most significant water resource is the 128 acre Thompson's Lake, which has a classification of "A" meaning it is suitable for use as drinking water, and has a standard of (T) indicating that it supports a trout population as determined by the NYS DEC. There is also a small pond within Thacher Park and several streams that pass through the park. Several wetland complexes are also located within the park. They are not large enough to be mapped as New York State DEC regulated wetlands; however they are mapped as federally regulated wetlands under the National Wetlands Inventory (NWI) program. (Figure 7)

Natural Resources

The park is located on the Helderberg Escarpment, a geologic feature that defines the northern limit of the Appalachian Plateau. The escarpment is world renown for diversity and abundance of fossils from the Devonian age, a period spanning roughly between 419 and 359 million years ago. The limestone bedrock gives rise to karst landscape features including caves and crevices, sink holes, springs, and cliffs. These features add significantly to the biodiversity of the park, which contains 21 distinctive ecological community types, as documented in the New York Natural Heritage Program report on rare species and ecological communities. (Evans and Weldy, 2000 and 2000a) The high elevation of the parks (1000' to over 1500') and cooler climate creates habitat conditions more similar to a mountain region than the nearby Hudson valley. Thacher Park is an Audubon Society designated Important Bird Area, and as a New York State Bird Conservation Area.

For detailed lists of Flora and Fauna see Appendix D.

Cultural Resources

The area of the park has a long history extending to before Europeans arrived on the continent. The archaeology of the area near Thompson's Lake is of interest because of its isolated location above the escarpment. Prehistoric people camped, fished and made tools as early as 6000 B.C. Some archaeological testing has confirmed the existence of these sites.

The history of the park is chronicled in maps and various publications that document the existence of houses and structures that once stood on the property now in the park. Several park trails follow the alignment of some of the original roadways previously used to access these sites. A one room schoolhouse in the park was put on the nation register of historic places in 2005.

Scenic Resources

The main scenic resource of the park is the vista from the top of the Helderberg Escarpment which can be viewed most prominently from “The Overlook” parking area and the Escarpment Trail. This magnificent panorama has no parallel in the capital district area. The view takes in the Hudson and Mohawk Valleys and the Adirondack and Green Mountains. Other scenic vistas and views are available throughout the park.

Recreational Resources/Activities

Recreation resources at the park are many and varied. These include swimming, boating, camping, hunting, fishing, picnicking, picnic pavilions, and recreational trails. The trails are open year round and accommodate hiking, bicycling, snow shoeing, cross-country skiing and/or snowmobiling.

The Emma Treadwell Thacher Nature Center has environmental exhibits and educational programs. Environmental Education and Interpretation programs occur throughout the park as well as in the form of interpretive signage on some of the trails.

The park has playgrounds at various locations.

Operations and Maintenance Overview

The park has a written Emergency Action Preparedness Plan, which is posted in all staffed buildings. The emergency action plan details park staff roles and responsibilities, evacuations and responses to emergencies. Park Police and other local enforcement respond to emergencies. Ambulance squads from neighboring towns respond to medical emergencies.

Buildings and infrastructure are maintained by park and regional maintenance crews.

The water supply for Thacher Park is a water treatment plant on Thompson’s Lake. The water supply for the campground and nature center is a water treatment system (new in 2008) working from three wells on park property.

Thacher park and the campground use a wastewater treatment plant in the eastern part of the park. Some facilities are being converted to use septic systems.

Thacher Park is open year-round but certain areas are closed to vehicular traffic from November to April. The campground is open for camping seasonally from May through Columbus Day. The Emma Treadwell Thacher Nature Center is open year-round.

Development of Alternatives

This chapter contains an analysis of the alternatives being considered and is divided into three parts - natural and cultural resource protection, recreational resource development, and operations and maintenance. The alternatives and preferred alternative for each plan element are described in narrative form. A complete description of the plan that results from the preferred alternatives is found in the master plan document.

Natural Resource Protection Strategies

Bird Conservation Area (BCA)

The BCA will be expanded to include all of the park.

Natural Heritage Area (NHA)

An NHA will be created which includes the Calcareous Cliff Community and lands below the cliffs to the park boundary.

Recreational Resource Development

Glen Doone Picnic Area

The Glen Doone picnic area will be re-designed with a roof covering the patio, a rehabilitated concession stand, better views and a second, modern comfort station.

Comfort Stations

Comfort stations at the park will be replaced with either new, modern “micro-stations” or composting toilets. New septic systems will be installed.

Athletic Fields and Courts

A new full basketball court will be constructed at the north end of the Pear Orchard picnic area parking lot.

Trails

Several trails will be removed or relocated to more sustainable routes. Some new trails will be installed which will replace undesignated trails and unsustainable trails. A mountain biking skills park connected to a system of bike trails will be created. No trails will be designated for equestrian use. Snowmobiling will have a reduction in trail mileage although designated trails for snowmobiling will continue to run the length of Thacher SP from north to south with further exploration for external trail connections. The Salisbury trail connecting the two parts of Thacher SP will be upgraded as part of the development of a bike path. New trails will be created to give the public access to the Tory Cave and Hailes Cave areas.

Caves

In order to protect hibernating bat populations, a bat gate will be installed at Hailes Cave. All caves at the park will be inventoried and mapped through a volunteer agreement with the Northeastern Cave Conservancy, Inc (NCC). A permit system will be established for public access to certain caves on guided tours.

The Meadow

The site of the former pool complex in the center of the Horseshoe area will be redeveloped with new recreation amenities including a challenge course featuring low/high ropes activities, lawn areas and walkways for strolling, which will better connect parking areas, picnic pavilions, existing trails, the new bike path and the new visitor center. The area will also be configured to better accommodate large events to be held at the park.

Camping

A new tent camping loop will be installed north of the current camping loops. Campsites in the “A” loop will be electrified.

Beach Expansion

The beach at Thompson’s Lake will be expanded to the north.

Rock Climbing

Rock climbing will become a permitted activity in the park. Climbing, at locations selected by OPRHP, will be allowed by park-issued permit only.

Operations, Infrastructure and Facilities

Combining the parks

The two parks will be combined into one park called “John Boyd Thacher State Park.” The campground will be included in the park and will be called “Thompson’s Lake Campground at John Boyd Thacher State Park.”

Visitor Center

A new visitor center will be constructed at the Indian Ladder Picnic Area that will provide improvements to visitor orientation, interpretation, amenities and community uses. This facility will also include a space for exhibits of park geology, provide a meeting space, park offices, indoor event rental space, restrooms and serve as a warming hut in the winter. The building is designed using native materials and energy efficient/sustainable mechanical systems and lighting.

Traffic Calming on Route 157

OPRHP will engage in conversations with NYS DOT about cooperative ways of improving pedestrian safety at crossings in the park.

Parking Lots

The main parking lot at the Meadow will be rehabilitated as will several of the picnic area parking lots. Some parking lots that are underused will be eliminated. Wherever possible rehabilitation will include green infrastructure to reduce impacts of stormwater runoff.

Structures in the Park

Several structures in the park which are un-used will be removed. These include the old manager’s house, the comfort station at upper Paint Mine, the small building at the former pool area and the barn and horse shed across from the rental property.

Selection of the Preferred Alternative

Identification of the Preferred Alternative

The two alternatives considered are the Status Quo and the Master Plan. The preferred alternative is the master plan alternative as described in the accompanying document.

Rationale for Selection

The park no longer meets the needs of OPRHP nor the recreational demands of the population within its service area. A new vision and goals for the park were developed by the Agency to guide this planning effort and the future development. The Master Plan is the preferred alternative because it fulfills the vision and goals for the future of the park recreation and management needs while balancing natural resource protection.

Environmental Impacts and Mitigation

The master plan for John Boyd Thacher State Park seeks to offer improvements to existing natural resource protection strategies and recreation development while delivering additional protection of sensitive natural resources within the park, at the same time providing new and expanded recreational resources. Planning for new facilities in the park reflects this and the proposed location of new or expanded facilities avoids sensitive resources to the extent practicable.

The implementation of the master plan will have some negative and positive impacts to natural – including upland, wetland, and aquatic, scenic, and other resources. All negative impacts will be mitigated through design and management techniques.

Chapter 1 – Environmental Setting

Location and Access

John Boyd Thacher State Park (Thacher SP) is located on the Helderberg escarpment on NY 157 approximately 4 miles west of the intersection with NY 85 (New Scotland Road). Portions of the park lie in the towns of Berne, Guilderland, New Scotland and Knox.

Thompson's Lake Campground is located on NY 157 in the town of Knox. It is approximately 3.5 miles west of the main part of Thacher SP. A second entrance, serving the Emma Treadwell Thacher Nature Center (Nature Center) is on Nature Center Way (formerly Stan Levine Drive) off of Ketcham Road.

All parts of the park are accessible by motor vehicle from NY 157. There are no bus routes that access the park. Pedestrians and bicyclists also enter the park from the main State roads. Access on foot is also available from the Long Path, a hiking trail that extends 375 miles from Fort Lee Historical Park in New Jersey to NYS Route 146 just outside of Thacher SP.

The park is within reasonable driving distance from the Cities of Albany, Schenectady, Troy and Amsterdam.

Economic Contribution

In March 2009, a study prepared for Parks & Trails New York by the Political Economy Research Institute (PERI), University of Massachusetts-Amherst, found that the combination of annual state resident and visitor spending at all New York State Parks supports up to \$1.9 billion in economic output and business sales and up to 20,000 jobs throughout the State. For the Saratoga-Capital District park region, which includes John Boyd Thacher State Park, the figures are \$249 million and 2,929 jobs.

Ecosystems within state parks provide many support services to communities, such as reducing negative effects of pollution, supporting soils and providing erosion control, protecting water quality, providing flood and storm protection, and supporting critical ecosystems and wildlife habitats.

Recreational Needs Assessment

Definition of Facility Service Area. The master plan identifies Albany and Schenectady counties as the service area of the park. It is common practice in recreation planning to identify a service area from which the facility draws approximately 75% of its users (Haas et al, 2007). John Boyd Thacher State Park is a popular regional park which serves the public mainly from Albany and Schenectady County, including the Cities of Albany and Schenectady.

Determining the Relative Index of Needs. The Relative Index of Needs (RIN) is a method for comparing the demand for a particular recreation activity in the service area with the statewide demand for that activity. RIN is expressed with a numerical scale, 10 being the highest relative level of need and 1 the least. Five is considered the statewide average in the current year (in this case the most recent numbers available are for 2005). (OPRHP, 2008)

The RIN for each New York State county was determined using a statewide survey. The values for Albany and Schenectady counties are presented in Table 1. The index of need over the entire service area was calculated using a weighted average of the two counties based on population. The resulting figure (also included in Table 1) expresses demand for a particular activity within the service area.

Only those activities which score a weighted average of five or more are included in the table. (OPRHP, 2008)

Table 1 Relative Index of Recreational Needs
(Only activities with weighted averages of 5 or greater are listed)

Activity	Albany	Schenectady	Weighted Average
Boating	7	6	6.66
Hiking	6	6	6
Walking for Pleasure	6	6	6
X-Country Skiing	6	6	6
Biking	6	5	5.68
Camping	6	5	5.68
Equine Activities	6	5	5.68
Fishing	6	5	5.68
Downhill Skiing	5	5	5
Golfing	5	5	5
Snowmobiling	5	5	5
Swimming	5	5	5

Source: 2009-2013 Statewide Comprehensive Outdoor Recreation Plan (OPRHP, 2008)

Park Boundaries

Most of Thacher SP lies on top of the Helderberg Escarpment in the Towns of Guilderland, New Scotland, Knox and Berne. A smaller portion of the park lies on the slope below the escarpment in the Towns of Guilderland and New Scotland.

The campground is approximately 4 miles east of the escarpment in the Town of Knox.

The boundaries are depicted in Figure 1.

Adjacent Land Uses

The surrounding land is predominated by agriculture, vacant and suburban rural residential classifications. (Figure 2)

Legal Considerations

- Two landowners have access rights-of-way through the northern part of Thacher SP.
- The Patroon Land Foundation has a 20 foot wide easement through a section of Thacher SP for the purpose of allowing farm equipment to access their land.
- OPRHP maintains an Open Space Conservancy trail easement across Patroon Land Foundation property for the Salisbury Trail connecting Thacher SP to the campground and nature center.
- OPRHP water and sewer lines run through several private properties
- There are DOT restrictions from doing work within ten feet of the shoulder of Route 157 running through Thacher SP.

Programs and Partnerships

Most of John Boyd Thacher State Park has been designated as a Bird Conservation Area (BCA). (Figure 3) There are 171 species of birds that have been identified within the John Boyd Thacher BCA, of which 102 are confirmed or probable breeders, including several species of special concern. The forests also support some of the area's highest densities of breeding songbirds. This BCA also supported the first recent regional nesting area of common ravens and is now the nucleus for the population in the area. (DEC, 2004)

Land and Water Conservation Fund

John Boyd Thacher State Park has received funding through the National Park Service Land and Water Conservation Fund. Acceptance of this federal funding includes a requirement that these facilities remain in public outdoor recreational use in perpetuity. Any proposals for uses other than public outdoor recreation require the prior approval of the National Park Service to lift the use restriction through a process known as “conversion.” (NPS 2008)

Physical Resources

Geology

Geology is perhaps the most significant factor that contributed to the formation of John Boyd Thacher State Park. The prominent cliff of the “Helderberg Escarpment” that runs through the park and to the south attracted the public, geologists and paleontologists for a century before Emma Treadwell Thacher donated lands to the State of New York as a legacy of her husband’s effort to preserve the cliffs from development. (Ver Straeten, 2012) (Figures 4 and 5)

John Boyd Thacher State Park is perched atop the Helderberg Escarpment, one of the richer fossil bearing formations in the eastern United States. The Helderberg Escarpment is the northeastern most extent of the Helderberg Plateau at its juncture with the Mohawk and Hudson Valleys. This juncture is, in part, responsible for the dramatic escarpment, which rises over 700 feet from the valley floor, capped off by 100 feet high sheer cliffs.

The Helderberg Plateau consists predominantly of layers of shale, sandstone, and limestone. The cliffs of the escarpment stand out in large part due to the more resistant nature of the limestones of the Manlius and Coeymans Formations that form the bulk of the cliff. Softer, more easily eroded rocks below these limestones (Schenectady, Indian Ladder, Brayman and Rondout Formations) form the slopes below the cliff.

Water flowing through the layers of limestone on the plateau has created a karst landscape. This formation, along with the shallow depth to bedrock, limits development in the area of the park adjacent to the escarpment.

The broken, fractured character of relatively weak rocks, in combination with a moist temperate climate, a chiefly north-facing aspect to the cliff (away from direct sun), and high cliffs make the rock at and near the cliffs at Thacher less stable than many other escarpments. Pre-existing breakage/fracturing of rocks weakens them; and allows natural weathering processes to act on them more quickly, allowing for further weakening. Thacher’s “Indian Ladder” cliffs are formed of limestone, made of the mineral calcite. Calcite has a hardness of 3 on a scale of 1 to 10 (where ten is the hardest; think diamonds). In contrast, the Shawangunk rocks at Minnewaska are made of quartz, with a hardness of 7 on a scale of ten. So, Thacher’s rocks are weaker also due to their composition. Thin rock layers in parts of the Manlius Limestone also add to these issues. (Ver Straeten, 2013)

Topography

The most significant topographic feature of the park is the escarpment. With cliffs averaging 100 feet in height it dominates the park’s and the area’s landscape. While providing the spectacular view and opportunities for geologic education and interpretation, it also presents a safety concern and a physical barrier to some development.

Otherwise, the park has a moderate topography of rolling hills typical of the Appalachian plateau. (Figure 6)

Soils

The soils at Thacher SP are mainly made up of those derived from the limestone, sandstone, shale and siltstone of the parent glacial till material. In these soils, depth to bedrock ranges between 0 to 20 inches with rock outcrops common. This shallow bedrock restricts development at the park when deeper excavations (such as for basements) are needed. (See Appendix C for soil limitations). There are small areas at the park (mostly in the southern end) where soils have a depth to bedrock of 20-40 inches and, rarely, over 60 inches.

The campground area has more variety in the soils. Depths to bedrock include some areas of greater than 60 inches.

Drainage characteristics of the soils in the park vary from poorly drained to well drained. A more detailed description of the soils and their limitations for development can be found in Appendix B.

Water, Watersheds and Wetlands (Figure 7)

Streams. The streams in Thacher SP are classified “C” by the DEC. This classification designates streams that support fisheries and are considered suitable for non-contact activities such as fishing and boating.

Lakes and Ponds. The most prominent water feature in the park is Thompson’s Lake. Thompson’s Lake is a naturally occurring water body with a surface area of 128 acres and a maximum depth of 19 meters. The lake is currently classified by DEC as class A(T) indicating that it is suitable for primary and secondary contact recreation, fishing and as a source of drinking water. The “T” denotes the lake as trout waters. State Parks owns a small section of the shoreline of the lake on the northwest side which includes a swimming beach and cartop boat launch. The beach is monitored weekly in accordance with the State Sanitary Code and has excellent water quality. There are approximately 75 residences and seasonal camps along the shoreline of the lake and there is an active Lake Association. DEC operates a boat launch site on the southern end of the lake (Snow and Terbush, 2013).

State Parks Water Quality Unit has monitored the Lake and determined that the trophic status of the lake is between oligotrophic and mesotrophic indicating a low to moderate level of productivity. Two invasive aquatic plant species: Eurasian water milfoil (*Myriophyllum spicatum*) and curly-leaved pondweed (*Potamogeton crispus*) were observed in varying densities in the lake. In addition, zebra mussels have been found in several locations along the lake shore (Snow and Terbush, 2013)

A small, man-made (earthen dam) eutrophic pond is located in the northern part of Thacher SP and was assessed by OPRHP staff in 2012. This pond has been historically inhabited by beaver but currently no beaver are present, possibly due to potential food source exhaustion. (Cebada Mora, Snow and Smith, 2012)

Ground Water. Because of the nature of the Karst terrain underlying the park, surface water (runoff and streams) can penetrate deeply into the bedrock and reach the groundwater.

As an example; there is no surface outflow from Thompson’s Lake. The lake outflow is underground through a “cave” at the southern end of the lake consisting of cracks in the underlying limestone. This may provide a direct linkage between Thompson’s Lake and subsurface ground water.

Watersheds. The parks are part of several sub watersheds, all of which are part of the Mid-Hudson watershed. (Figure 7)

Wetlands. There are no DEC regulated wetlands in either park. Several federally identified wetlands (NWI) are present. (Figure 7)

Air Quality

Albany County is within the Capital Region nonattainment area for ozone. Local emissions in the Albany area are the primary driver for the ozone exceedances. Since winds are predominantly from the S to SW on the warm days that are conducive to ozone formation, the highest ozone readings are often seen to the north and east of the core Albany metro area, for example, in The Towns of Grafton and Stillwater. Exceedances are far less common at the Schenectady monitoring station, which is normally upstream of most of the Albany metro area during high ozone events. This shows the strong influence of local emissions on ozone levels. Emissions from the New York City and Connecticut areas often contribute as well. Albany County is not within a nonattainment area for particulates. (DEC, 2010)

Climate

The park is located in the humid continental climate zone and has cold, snowy winters, and hot, wet summers; the area experiences four distinct seasons. Rainfall averages of 38.6 inches per year. Snowfall is significant, totaling an average of 62.7 inches annually. The area is close enough to the Atlantic coast to receive heavy snow from Nor'easters and occasionally Alberta clippers. Winters can be very cold with fluctuating conditions; temperatures often drop below 0°F at night. Summers in the park can contain stretches of excessive heat and humidity, although less extreme than the surrounding lowlands, with temperatures above 90°F. Record temperature extremes measured nearby at the Albany International Airport range from -28°F on January 19, 1971, to greater than 100°F on September 3, 1953. (NOAA, 2011) The higher elevation of the parks causes their temperatures to be somewhat cooler.

Natural Resources

The Helderberg Escarpment is world renown for diversity and abundance of fossils from the Devonian age, a period spanning roughly between 419 and 359 million years ago. The limestone bedrock gives rise to karst landscape features including caves and crevices, sink holes, springs, and cliffs. These features add significantly to the biodiversity of the park, which contains 21 distinctive ecological community types, as documented in the New York Natural Heritage Program report on rare species and ecological communities. (Evans and Weldy, 2000 and 2000a) The high elevation of the park (1000' to over 1500' above sea level) and cooler climate creates habitat conditions more similar to a mountain region than the nearby Hudson valley. Thacher SP is an Audubon Society designated Important Bird Area (IBA), and portions of the park are designated as a BCA.

Flora

The flora of the park is greatly influenced by the karst geology. Not only does this create opportunities for varying ecological conditions, it also affects other site conditions such as soil types, topography, pH, and permeability which affects the types of plants found. In general, the flora at the park is typical of those found in the rest of the Helderbergs for the given altitude. An extensive study of the flora in the area, although not specific to the park, is provided in Appendix E of the Helderberg Escarpment Planning Guide (Driscoll and Childs, 2002) and is included as an appendix of this document. (Appendix C)

The southern zone of Thacher SP is largely forested uplands. Hemlock-Northern Hardwood Forest is the most dominant forest type, followed by Maple-Basswood Mesic Forest, and limited areas of successional Northern Hardwood Forest. Two small wetlands include Shallow Emergent Swamp and Shrub Swamp communities. The limestone bedrock provides a shallow albeit rich soil for a wide

variety of perennial herbs and ferns. Areas of shale bedrock give rise to acidic soils and related plants such as Pink ladyslipper (*Cypripedium acaule*) and Hobblebush (*Viburnum alnifolium*).

The northern zone of Thacher SP consists of young mixed forest, successional old fields and grasslands. A Northern White Cedar swamp is fed by a spring in the woodland at the campground.

Rare Plants

Two rare plants, smooth cliff brake (*Pellaea glabella ssp glabella*) and small mousetail moss (*Myurella julacea*) are currently known in Thacher SP and four other species are known historically from the park area. Smooth cliff brake has a State status of Threatened and small mousetail moss has an Undetermined State status.

In May of 2012 a site specific survey was conducted by OPRHP and NHP staff to ascertain the existence of rare plants in a critical area of the park. During this recent survey, the original population of smooth cliff brake documented in 2000 (Evans and Weldy, 2000 and 2000a), as well as substantial additional populations, were found. The 2000 study includes management recommendations for this plant such as placing signage at the appropriate location to educate park users and explaining the fragile nature of the area to discourage people from inadvertently damaging the plant or its habitat.

There are only 17 known locations of smooth cliff brake in New York. The unique geology of the Helderberg Escarpment provides good-quality habitat for this rare plant at Thacher State Park. The population at Thacher contains over a hundred plants, and there may be more patches of plants growing on inaccessible parts of the cliffs. Because of their rarity in the State and Region, every effort should be made to protect the smooth cliff brake population at Thacher State Park. (Smith 2012 and NYNHP 2013)

The campground area was surveyed by NHP in 2000 and was found to contain one historic record of a rare plant from 1934 that has since been considered extirpated and is no longer tracked by NHP. (Evans and Weldy, 2000a and Evans, 2004)

Invasive Plants

The most widespread non-native invasive flora species in John Boyd Thacher State Park are common buckthorn (*Rhamnus cathartica*) and bush honeysuckles (*Lonicera spp.*). Garlic mustard (*Alliaria petiolata*), spotted knapweed (*Centaurea maculosa*), common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*) and a number of other non-native invasive plants are also found in the park.

Curly pondweed (*Potamogeton crispus*) and Eurasian water-milfoil (*Myriophyllum spicatum*) are aquatic invasive species that have been found in Thompson's Lake.

Fauna

The fauna of this area comprise a diverse mixture of organisms associated with distinct habitats. The parks lie in an area which has been historically used for farming and still contains considerable acreage in agriculture. The surrounding forested lands are almost exclusively second or third growth, having been cleared at some time in the past. Below the escarpment, development of rural and suburban housing has had another type of influence on the habitat and the faunal mix.

A significant influence on some of the faunal species in the Helderbergs is the cliff face itself. This vertical element, not found commonly, imposes a topographic and climatic gradation on the organisms that reside there. This habitat is especially attractive to birds and bats which can reach the cliff by means of flight.

A man-made influence on faunal mortality is the presence of Route 157 running through the length of the park. Various large and small animals cross the road to get from one habitat to another exposing them to motor vehicles. Other, interior park roads are narrower and have lower speed limits but still present a barrier and a danger to fauna.

The varied habitats of the park are home to all common mammals of the region, including numerous small rodent species, muskrat, beaver, mink, fisher, otter, porcupine, striped skunk, coyote, red and grey fox, raccoon, white-tailed deer, eastern cottontail, bobcat, black bear, and eight species of bats. The karst landscape provides dens and caves for hibernating bats, bears and other mammals. Vernal ponds help support 9 species of salamanders and 6 species of frogs.

John Boyd Thacher State Park is an Audubon designated Important Bird Area and parts of the park are designated BCA, with 171 species documented. Of these 102 are confirmed or probable breeders. The forests support some of the areas highest densities of breeding songbirds such as hermit thrush, winter wren, magnolia, black-throated blue, black-throated green, blackburnian, Canada and worm-eating warblers and Louisiana and northern waterthrushes. Fields along Ketcham Road are maintained as habitat for grassland birds.

The birds, fish, mammals, amphibians and reptiles that are found in the surrounding areas are representative of those found in the parks. Lists derived from studies of the records of fauna in the area, although not specific to the park, are provided in Appendix E of the Helderberg Escarpment Planning Guide (Driscoll and Childs, 2002). This information is included in this document as Appendix C.

Rare, Threatened, Endangered and Special Concern Species

The park has been well-known for supporting a population of bats. Two rare bat species have been documented in the park (Evans and Weldy, 2000, Evans, 2003). However, since the arrival of white-nose syndrome, large die-offs of bats have been documented at this site and across the region. Research is ongoing by a number of agencies to determine if there are measures to protect these populations. (Lundgren, 2012)

Of the salamander species in the park, the Jefferson salamander (*Ambystoma jeffersonianum*), is a species of Special Concern. Habitat requirements include vernal ponds for breeding.

Bird species of special concern found in the park are: sharp-shinned hawk (*Accipiter striatus*), cooper's hawk (*A. cooperi*), northern goshawk (*A. gentilis*) and golden-winged warbler (*Vermivora chrysoptera*). This park also supported the first recent regional nesting area of common ravens (*Corvus corax*) and is now the nucleus for the population in the area (DEC, 2004; McGowan and Corwin, 2008). This was a breeding record of northern harrier, a state-threatened bird last verified at a site along Ketcham Road in 2002.

Invasive Fauna

Zebra mussel (*Dreissena polymorpha*), a non-native invasive bivalve, is found in Thompson's Lake. Populations of the mussel are found along the shoreline of the entire lake including the park beach and car-top boat launch. In addition to being detrimental to the aquatic ecosystem, these mussels have been known to clog water intake structures and their shells are very sharp and known to cause deep cuts. This is a potential danger to all who are swimming, wading, fishing, launching water craft, etc.

Rusty (*Orconectes rusticus*) and virile (*O. virilis*) crayfish are invasive crustaceans that have also been found in Thompson's Lake.

Ecological Communities

Twenty-one distinct ecological community types (Figures 8 and 9) have been delineated in the park. This includes roughly 80% percent natural vegetation and 20% in culturally derived communities

comprised of areas that are developed, mowed, quarried, or cultivated (Lundgren, 2012) These totals include lands acquired since the 2000 report (Evans and Weldy, 2000.) The natural landscape is dominated by hemlock-northern hardwood forest with smaller patches of maple-basswood rich mesic forest, successional northern hardwoods, successional old field and shrub lands, and the calcareous cliff community. Several small patches of old conifer plantation are succeeding to northern hardwoods, but are still recognizable as former plantations. A small area of shrub swamp and red maple-hardwood swamp exists in the southwest part of the campground area and there is a small hemlock-northern hardwood forest in the central part. Aquatic systems on the property include several small intermittent streams and a eutrophic pond that was created by beaver activity along a stream that flows south, towards Thompsons Lake. (Evans, 2004)

Statewide significant ecological communities in Thacher SP are calcareous cliff community, limestone woodland and maple-basswood rich mesic forest. NHP significant communities are defined as types that are rare or that represent high quality examples of common community types.

Observations made on several other site visits, as well as on orthoimagery (aerial photos) and new land cover type maps suggest that there may be additional patches of the natural communities of statewide significance (Lundgren, 2012). Additional surveys are needed to assess those areas and to update the significant community maps.

Cultural Resources

Pre-historic

Long before Europeans arrived on the continent, Native Americans were traveling from the western hills of the Schoharie Valley to the Hudson River Valley by way of footpaths. The tall trees they felled against the cliff and trimmed for easy climbing were called “Indian Ladders” by the early settlers, giving rise to the name of the region.

Archeological

The archeology and history of the area around Thompson’s Lake is of special interest because of its isolated location above the Helderberg escarpment. It was a place where prehistoric people perhaps as early as 6000 B.C. camped, fished, and repaired tools for brief periods during hunting trips. In 1922 an archeologist with the NYS Museum reported that the site of a small camp on Thompson’s Lake had been found, and that there was said to have been a cave nearby with Indian relics and a large carved tablet. Archeological testing for a new water line in the park in 1985 revealed no evidence of prehistoric occupation. However, in 1999, archeological testing for the proposed Nature Center at Thompson’s Lake confirmed the existence of a site at the northwest corner of the lake.

Historic

Old farm maps and publications show and document the existence of several houses and structures that once stood within the current property boundary lines of John Boyd Thacher State Park. There appears to be evidence of structures and houses that were part of the farms atop the escarpment including the Glen Doone and Greenhouse areas as well as structures adjacent to Beaver Dam Road on the south side of the park.

A one room schoolhouse on Ketcham Road was last used as a schoolhouse in the 1930’s. In 2005 it was put on the national register of historic places and has been undergoing restoration by a group of dedicated volunteers.

Scenic Resources

Vistas

The main scenic resource of the parks is the vista from the top of the Helderberg Escarpment. This magnificent panorama is accessible from several points in Thacher SP. It has no parallel in the capital district area. The view takes in the Hudson and Mohawk Valleys and the Adirondack and Green Mountains.

A great deal of attention has also been given to the view of the escarpment from off site. This has been studied in detail by the Helderberg Escarpment Planning Committee (Driscoll and Childs, 2002). This scenic resource, both as a source of views and an object of interest is important and should be protected in planning any development of park facilities along the escarpment.

Star Gazing

Because Thacher SP closes at sunset there is no general star gazing program there. Permits have been issued in the past for groups watching special astronomical events. There are regular star gazing programs at the Nature Center during the summer.

Recreational Resources/Activities

A map of existing recreation resources in the parks can be found on Figure 10.

Swimming

Thompson's Lake Beach

John Boyd Thacher State Park offers a small but very popular sandy beach located on Thompson's Lake at the campground on the southeast area of the "A Area" camping loop. The swimming area is small (50 yds wide x 30 yds deep) with a total bather capacity of 344 persons. This swimming area was originally for use by camping patrons only. However the Thompson's Lake beach was opened up to day use by the general public in 1999 after the first indication of the closing of the Thacher Pool.

Pools

John Boyd Thacher State Park had a popular Olympic size swimming pool which was opened in 1954. It was closed in 2007 due to overwhelming maintenance issues and concerns for public safety.

Boating

The park offers the launching of human powered, hand carried craft from the shoreline of Thompson's Lake below the Nature Center, north of the beach/swimming area. Rowboats, kayaks and paddleboats are available to rent from Memorial Day through Labor Day.

There is a public boat launch managed by The New York State Department of Environmental Conservation near the southern end of the lake, well outside the park boundary. This launch is suitable for the launching of trailered boats, and accessible from Thompson's Lake Road. . The DEC limits the launching of motorboats from this ramp to only those that are less than 15 horsepower.

Day use areas

Picnic Areas

Thacher SP has picnic tables and grills throughout the southern portion of the park which are available on a first come – first served basis. Some are located in secluded, wooded areas while others are located near the escarpment and offer a spectacular view of the Hudson Valley, the Albany skyline, the Green Mountains and the foothills of the Adirondacks.

Pavilions

Thacher Park offers 9 reserve-able picnic shelters as well as 2 smaller, 20’ x 20’ tents. Pavilion capacities and amenities are listed in Table 2.

Table 2 Picnic Shelter Fact Sheet
(*Indicates that the facility is shared with other picnickers)

Name	Capacity	Amenities	Utilities	Accessible	Sports
Hailes Cave Shelter	150	Shelter, adjacent grills, picnic tables under the shelter	Lights and electric	No	Ballfield, volleyball court, horseshoe pits and swings*
Horseshoe I Shelter	75	Shelter, adjacent grills, picnic tables under the shelter	None	Shelter and Restroom	Ballfield, volleyball court, horseshoe pits and swings*
Horseshoe II Shelter	100	Shelter, adjacent grills, picnic tables under the shelter	Lights and electric	Shelter and Restroom	Ballfield, volleyball court, and horseshoe pits*
Pear Orchard Shelter	150	Shelter, adjacent grills, picnic tables under the shelter	Lights and electric	Yes	volleyball court and horseshoe pits*
Paint Mine Shelter	150	Shelter, adjacent grills, picnic tables under the shelter	Lights and electric	Shelter and Restroom	Horseshoe pits, swings, and volleyball court*
Knowles Flat Shelter	75	Shelter, grills, picnic tables	Lights and electric	Restrooms in picnic area	Ballfield, horseshoe pits, volleyball court and swingsets in the picnic area
Glen Doone Shelter	75	Shelter, grills, tables, fireplaces	Lights and electric	No	Horseshoe pits, volleyball court and swingsets in the picnic area
Yellow Rock Shelter	75	Shelter, grills, tables	Lights and electric	No	Horseshoe pits and volleyball court in the picnic area
Greenhouse Shelter	75	Shelter, grills, tables	Lights and electric	Shelter and Restrooms	Horseshoe pits and volleyball court in the picnic area
Hailes Cave Tent	35-40	20’ x 20’ tent	No	n/a	Ballfield, volleyball court, horseshoe pits and swings*
Indian Ladder Tent	35-40	20’ x 20’ tent tables and grills	No	n/a	horseshoe pits and volleyball court with Pear Orchard*

Playgrounds

There are currently three playgrounds at Thacher SP, and a playground near the Thompson’s Lake beach.

Trails (Figure 12)

The park has approximately 28 miles of designated trails. The southern trails zone has over 13 miles of trails; 7.5 miles of which are multi-use trail designated for hiking, biking, cross-country skiing, snowshoeing and/or snowmobiling. Many of these trails are close to picnic areas and other recreational amenities offered by the park. This area includes the famous Indian Ladder Trail along the base of the Helderberg Escarpment. This zone also features 2.3 miles of trail along the top of the escarpment and offers a number of scenic views from various vantage points.

The northern trails zone of the park is heavily wooded and not in close proximity to picnic areas and other recreational amenities. This trails zone offers 11 miles of multi-use trails including a couple of scenic overlooks.

The trail system in the park also includes a 7.5 mile section of the Long Path, a 356 mile trail beginning at Fort Lee Historical Park in New Jersey and winding north to its terminus just north of the park. This trail is maintained by dedicated volunteers.

There are over, over three miles of hiking, cross-country skiing and snowshoe trails in the campground area including the Nature Center. Bicycles and snowmobiles are prohibited on these trails.

An easement from the Open Space Conservancy allows park staff and the general public to use a short (.69 miles) trail to move from the campground area to the main park area.

Hunting and Fishing

Hunting, with a state hunting license and a park permit, is allowed in the northern section of the park at certain times of the year corresponding to DEC hunting seasons.

Fishing, with a state fishing license, is permitted on all waters in the park boundary. Fishing in Thompson's Lake is allowed from the shore of the park property and from boats.

Camping

Tent/Trailer sites John Boyd Thacher Campground has 2 camping loops encompassing 140 tent/trailer sites. There are no electric or water hook ups. A sewage pump out station is located at the beginning of loop A.

Group camps The campground does not have a group camp area. Requests for group camping have been accommodated if space can be provided without inconveniencing other campers.

Environmental Education and Interpretation

Environmental education and interpretation at the parks is presented through programming, nature center exhibits, outdoor interpretive signage, and publications.

A diverse array of environmental education and interpretive programs are offered at the Emma Treadwell Thacher Nature Center and the park throughout the year. Programs serve the local communities, park patrons, campers, area school groups, various youth and civic organizations and the general public.

Emma Treadwell Thacher Nature Center. The mission of the Nature Center is to provide a place for children and their families to learn about and interact with the natural environment, fostering awareness of their role in protection and conservation for future generations. Each year more than 8,000 visitors come to the Nature Center and are introduced to the wonders of the natural world. Permanent and seasonal interpretive exhibits and hands-on activities focus on natural history and conservation topics. Binoculars, microscopes, hand lenses, and touchable collections encourage exploration. Brochures and informational materials are available, including an interpretive trail guide. On the grounds, there are labeled native plant gardens and a self-guided interpretive trail.

Outdoor Interpretive Programs The parks offer outdoor interpretive programs that explore their diverse environments, including the escarpment, a variety of woodlands, vernal pools, old fields, grasslands, and Thompson's Lake. Programs are also offered interpreting the rich cultural history of the park and region. Field trip and outreach programs are available for area school groups year

round. The Friends of Thacher Park have secured grants to fund buses that allow schools to bring children on field trips to the Nature Center and Thacher SP. A sampling of offerings throughout the year include programs on local wildlife, geology, entomology, recycling, birding, astronomy, amphibians, invasive plants, animal tracking, tree identification and local history.

Interpretive Signage. In addition to programs and Nature Center exhibits, interpretive information panels are posted in several areas of the parks. A series of signs along the Indian Ladder Trail give information on the geology, fossils, plants, animals and cultural history of the trail. At the Park Overlook, visitors will find a brief history of the park and highlights of the natural features, flora and fauna. An interpretive kiosk at the Carrick Road trailhead and a Bird Conservation Area kiosk also present interpretive information to visitors.

Operations and Maintenance Overview

Emergency Plans and Services

The park is in Albany County. Portions of the park lie within different townships. Depending on where in the park a fire may break out, responders will come from any one of a number of local agencies including New Salem, Berne, Knox and East Berne.

An Emergency Action Written Preparedness Plan (EAWPP) is posted in all staffed buildings within the parks. A copy is also kept on file with the Regional Safety Officer as well as at the regional Park Police headquarters. The emergency action plan details park staff roles and responsibilities, evacuations and responses to emergencies.

The NYS Park Police maintain a sub-station at the campground. The NYS Park Police support park activities and operations through enforcement of park rules and regulations, vehicle and traffic law and other criminal and environmental statutes as necessary. The NYS Park Police's enforcement and community policing efforts help maintain a good "quality of life" atmosphere at both State Parks.

In the event of an evacuation, NYS Park Police serve as command, assisted by the Park Manager and park staff. A combination of police and staff driving to various sites and/or areas of the park will inform patrons of the need to evacuate.

In addition to the NYS Park Police, Thacher Park Road (Route 157) is often patrolled by New York State Police and Albany County Sheriffs. The parks rely on the Sheriff's High Angle Rescue Team whenever there is an incident at the escarpment. An annual Special Use Permit is issued to the Sheriff's Department to conduct training for members of their High Angle Rescue Team.

The Voorheesville Ambulance will respond to a medical emergency at the main part of Thacher SP. For medical emergencies at the campground, the Helderberg Ambulance Squad will respond. Both ambulance squads are assisted by Albany County Paramedics.

Infrastructure

Buildings

John Boyd Thacher State Park

Buildings in use and serviced by water and wastewater systems:

- 8 public restrooms
- Park Manager's residence
- 6 bay block construction and maintenance shop

- Park office
- Wastewater treatment plant
- Overlook concession stand

Buildings in use but without water or wastewater facilities:

- 10 bay wood construction storage building (has electric)
- 2 steel construction cold storage buildings (have electric)
- Old wood construction horse barn
- Small gas house building with electric panel and gas and diesel tank monitoring system
- Concession stand in overlook (individual septic but part of water system)

Buildings no longer used:

- Old concession stand in Glen Doone area
- Old manager's residence in Hailes Cave area
- Wooden storage shed outside park office
- Old restroom in upper Paint Mine area
- Filter room from old pool

John Boyd Thacher Campground

Buildings on wastewater system and well water system:

- Nature Center
- 5 campground restrooms
- Police substation/park office building
- Lifeguard cabin
- Water treatment plant (not part of wastewater system)

Buildings not on water and wastewater systems:

- Contact station
- Recycling/storage building near water treatment plant
- 2 bay wood construction garage for equipment and supply storage

Water Supplies

The park has a water treatment plant on the southeast shore of Thompson's Lake. Surface water is drawn from the lake and goes through a slow sand filter (6 filter beds). It then goes to a wet well where it is pumped up to a 250,000 gallon reservoir in the main part of the park. The water is chlorinated as it leaves the treatment plant. From the reservoir, water is gravity fed to all distribution points.

The campground and the nature center have their own water treatment system that works off of 3 wells in the vicinity of the Nature Center. This system was new in 2008 and groundwater from the wells is pumped into a water treatment plant where water is chlorinated and then pumped into three 10,000 gallon water storage tanks. From there, the water is post-chlorinated and pumped to the campground distribution system.

Waste Water and Sewerage Systems

The park has a wastewater treatment plant with a trickling filter system. The plant is fed by a system of sewage lift stations. Those stations pump up to a final pump station north of the Hailes Cave area

and then all wastewater is pumped to the wastewater treatment plant. The system services restrooms at the park as well as the campground (through a force main), the nature center, the maintenance facility, manager's house and the park office. The park is currently in the process of trying to take pump stations off line and retrofit them with individual septic tanks and leach fields in order to reduce the amount of pumping needed. To date, one lift station has been taken off line and now a new septic system services the Greenhouse, Yellow Rocks, and Hop Field restrooms.

Five new restrooms at Thompson's Lake will utilize low-flow toilets and each restroom will have a small septic tank designed to catch larger solids that otherwise can bind up the pumps.

Utilities

Phone - Verizon Telephone

Internet - Time Warner Cable Roadrunner at Thacher Park Office, Nature Center and Thompson's Lake office, contact station and Park Police substation. Sprint connect card is used for internet access at the maintenance shop.

Electricity - National Grid. After connection at the southeast entrance to the park, lines run underground through the park. National Grid lines at the campground bring power to a pole near the Nature Center parking lot. From there, State Park owned overhead lines feed the park facilities.

Fuel Oil Storage - 1000 gallon tank behind the Thacher maintenance shop. Two 275 gallon tanks in the basement of the manager's house. 500 gallon tank outside of park police substation.

The Nature Center is heated by propane supplied by a 1000gallon tank.

A 1000gallon gasoline tank and a 500 gallon diesel tank are located in the maintenance area for fueling vehicles. Biodiesel (5%) is used for diesel.

Roads and Bridges

There are 4.7 miles of paved roadway at the park. Route 157 and other state roads are not included in this figures as they are not owned or maintained by OPRHP.

Dams and Culverts

There are two culverts crossing under roads that bring vehicular traffic into the campground. One culvert is on the campground entrance road and the other is at the beginning of the road leading into B Loop. In both cases, the pipe is rusted and no longer channeling water under the roadway in an effective manner.

Culverts under State Route 157 are the responsibility of DOT and culverts and bridges along the trail network are repaired as needed by park staff and/or trail volunteers

Maintenance

The maintenance shop is located on Maintenance Lane north of the manager's residence. Maintenance personnel maintain the grounds of both parks and the Nature Center. They also maintain the grounds at Athens Boat Launch Site in Athens and work with Village of Coxsackie to maintain the grounds at Coxsackie State Boat Launch Site. This includes all mowing, weeding, snow plowing and hazardous tree monitoring and removal. They also are responsible for all upkeep and repair of structures, fences, playground and recreational equipment and maintenance and service of all park equipment.

Season and Hours of Operation

The park is open year-round but certain areas are closed to traffic from approximately November through April of each year. Two restrooms, Hop Field and Minelot, remain open and heated in the winter. The Hop Field, Paint Mine, and Overlook parking lots are maintained and open throughout the year.

Park hours are from 8:00 AM to sunset daily. From the first weekend in May through Columbus Day in October, 3 ticket booths (Main Area, Paint Mine and Lagrange Bush) are open on weekends and holidays from 9 AM to 5 PM.

The park office is open daily from 8 AM to 4:30 PM in the winter and from 8 AM to 5:30 PM in spring and summer.

The campground is open for camping from the first Friday in May through Columbus Day. The campground is also open on a daily basis outside the camping season for hiking, skiing, snowshoeing and ice fishing. Traffic is open only to the A loop. No restrooms or other facilities are open at this time.

The Thompson’s Lake beach is open weekends only from Memorial Day weekend through the first weekend that pools in the region open (usually the third or fourth weekend in June). After that, the beach is open seven days per week. Beach hours are 10 AM to 6 PM daily.

During the camping season, with a few exceptions, the campground is staffed 24 hours per day, 7 days per week. The contact station is staffed from 7 AM to 10 PM daily during peak camping season.

The nature center is open year-round six days a week from 9 AM to 5 PM (closed on Mondays) There is no fee to visit the Nature Center although depending on the program being offered, there may be a nominal program fee per individual.

Parking Areas

Table 3 Parking Area Details

Location	Standard Spaces	ADA Spaces	Condition	Notes
Greenhouse	61	2	Excellent	
Yellow Rocks	105	2	Excellent	
Glen Doone - Upper	66	4	Excellent	
Glen Doone - Lower	50	2	Excellent	
Overlook - Lower	66	4	Excellent	
Overlook - Upper	24	2	Excellent	
Park Office	5	1	Fair	
Indian Ladder	99	2	Fair	
Pear Orchard	190	2	Fair	Includes Basket-Ball Court
Horseshoe I	68	2	Fair	
Horseshoe II - A	43	2	Fair	
Horseshoe II - B	77	2	Fair	
Hop Field	52	2	Good	
Paint Mine - Lower	45	2	Good	
Stone Lot		0	Poor	Closed to public
Maintenance		0	Poor	Closed to public
Knowles Flat - Upper	54	2	Excellent	New in Fall 2012
Lagrange Bush	75	0	Excellent	New in Fall 2012
Paint Mine - Upper		0	Poor	Closed to public

Location	Standard Spaces	ADA Spaces	Condition	Notes
Mine Lot	61	0	Poor	
Pool	310		Poor	
Hailes Cave Tent	31	0	Poor	
Hailes Cave	71	0	Poor	

Special Events/Permits

Special Use permits are issued for running events, orienteering events, pony rides, commercial tents, bounce houses, wedding ceremonies, rescue training, and various other unique activities.

The park issues annual Hunting Permits and allows hunting in the Northern Trail zone of the park. Hunting permits coincide with the hunting season for wildlife management unit 4H with the exception that spring hunting is not allowed which effectively ends the hunting season on March 31st. An average of about 100 hunting permits are issued annually.

Geocaching is another popular activity in Thacher Park. There are currently 14 permits encompassing approximately 25 caches.

Solid Waste Management and Recycling Programs

The park operates on a “Carry In – Carry Out” basis. However, park staff collect all garbage left behind. The park staff hauls left over garbage to the Albany Landfill. On average, the park hauls 20-25 tons of waste per year to the landfill.

All paper, cardboard and plastics are collected for recycling. Each year the park hauls about $\frac{3}{4}$ of a ton of mixed containers to the Cascades Recovery facility in Albany.

The park maintains a scrap metal pile behind the maintenance shop. Once per year metal is taken to a recycling facility. The park generates somewhere between $\frac{1}{2}$ and 1 ton of metal recycling per year.

Sustainability Programs

High efficiency boilers have been installed in the manager’s residence and at the maintenance shop.

In an effort to be more energy efficient, spray-in-foam insulation was installed at the manager’s residence, at the Nature Center and at the rental property on Ketcham Road.

As part of the work of the Saratoga-Capital District Region’s Sustainability Committee, park staff have undertaken a general park sustainability inventory in an attempt to document any possible energy and environmentally sustainable practices that could be utilized at the parks. This inventory will be used to coordinate the completion of projects that will improve the sustainability of the parks.

Chapter 2 - Development of Alternatives

Introduction

This chapter contains an analysis of the alternatives being considered for recreation resource development, natural and cultural resource protection, and operations. The alternatives considered and the analyses use resource inventory information, park goals, core team discussions, and other factors. Findings from the analyses are used in identifying the preferred alternatives for each of the resource categories. The status quo, alternatives, considerations and preferred alternative for individual issues are described in narrative form. A complete description of the plan that results from the preferred alternatives is found in the master plan document.

The chapter is divided into three broad resource categories:

- **Natural Resource Protection** – Alternatives that focus on strategies for stewardship of the parks natural resources.
- **Recreational Resources** – Alternatives that primarily concentrate on the areas of the park that support various recreation activities. Included in this category are the built facilities and consideration of different types of recreation activities.
- **Operations, Infrastructure and Facilities** – Those buildings and management practices which provide support for the functioning of the park.

Natural Resource Protection Strategies

Natural Heritage Area

The goal of the New York Natural Heritage Areas Program (NHA) is to provide state land managers with a tool to recognize and assist in the protection of rare animals, rare plants, and significant natural communities on state-owned land. The NHA Program was established in 2002 in amendments to the Environmental Conservation Law (§11-0539.7). An NHA designation does not preclude existing or future land use proposals, nor should the designation prohibit park development or operational needs. In order to be eligible for NHA designation, an area must meet any one of the following criteria:

- provide habitat for "endangered species" or "threatened species" of animals or plants
- provide habitat for rare species as defined by the Natural Heritage Program (NHP)
- contain "significant ecological communities" where such term means all rare ecological communities that are rare in the State as well as outstanding examples of more common communities

Background

For detailed description of the ecological communities, flora, fauna and endangered species see the relevant sections in Chapter 1 of this document.

The park contains a number of Natural Heritage elements, and meets the criteria for NHA status. On a state-wide basis the park is in the top third of biodiversity rankings among all state parks. Among state parks in the Saratoga-Capital District Region, Thacher Park ranks as the park with the highest level of biodiversity.

Of particular focus is the swath of cliff and steep slopes on the eastern side of the park that include the rare plant and rare animal species, and natural communities of statewide significance. Nearly half (3 miles) of the entire length of an outstanding calcareous cliff community significant community occurs within Thacher State Park and is one of the largest examples of this community type documented in the State. An estimated 50 acres of cliff face occur in the park (calculated based on 22 acres horizontal projection and an average slope of 65 degrees) and this is the only section currently in protected or conservation lands status.

These statewide significant communities also include a high quality maple-basswood rich mesic forest which occurs in multiple patches, with some mature and little-disturbed forest below the escarpment, and somewhat younger forests above the escarpment embedded with streams and karst features and supporting a rich flora. Additionally, the park supports over 100 species of birds listed as breeding (confirmed or probable) in the park, including four species of Special Concern (sharpshinned hawk, cooper's hawk, northern goshawk, and golden-winged warbler) and is designated as a Bird Conservation Area. (see the alternatives analysis of the Bird Conservation Area in this document.)

Two rare plant species, including one that occurs on the cliff faces, and two rare animal species, also including one that is associated with the cliff faces, are currently known in the park as well as one animal concentration site, the assemblage of bat species at Haile's Cave which is a large and diverse example in the State. Only a small portion of the potential habitat for one rare plant has been inventoried due to difficult access. Additional surveys for this and one other are encouraged. Both the bats and the endangered plants are particularly vulnerable to human activity.

Because of the diversity of Natural Heritage elements and the additional biodiversity values represented at this park, the New York State Natural Heritage program recommends that a portion of the eastern part of the Thacher State Park be considered for NHA status. This portion could include but not be limited to, the calcareous cliff community, and its associated animal concentration area and rare plant and animal species; and the adjacent forest and woodlands. (Lundgren and Smith, 2012)

Alternatives Considered

(i) Status Quo – no NHA will be created

Considerations:

- Current status of the significant ecological communities and other Natural Heritage elements will remain
- No additional recognition of Natural Heritage elements will be created

(ii) Create an NHA on the escarpment to include the calcareous cliff community from the top edge of the cliff to the lower boundary of the park.

Considerations:

- Natural Heritage elements in the NHA will be recognized as significant to the ecology and biodiversity of the State and the Park.
- Will include some other ecological communities at the bottom of the cliff to the Park's boundary.

Preferred Alternative – (ii) Create an NHA on the escarpment to include the calcareous cliff community from the top edge of the cliff to the lower boundary of the park.

The creation of the National Heritage Area will help emphasize the importance of this ecological community. Figure 11 illustrates the area that is chosen.

Bird Conservation Area (BCA)

The BCA program aims to integrate bird conservation into Agency planning, management and research projects, within the context of the Agency mission. Bird Conservation Areas are described under Article 11, Title 20 of the Environmental Conservation Law (ECL). The creation of a BCA does not preclude existing or future land use proposals, nor should it prohibit park development or operational needs. In addition to recognizing the importance of bird conservation within the planning process, a BCA can create heightened public awareness of the site's important bird community, as well as funding opportunities for bird related education, research and conservation.

Background

There currently is a BCA at John Boyd Thacher and Thompson's Lake State Parks (Figure 3). The BCA was designated in 2004 and meets the following criteria:

Key BCA Criteria: Migratory bird site, diverse species concentration site; species at risk site (ECL §11-2001, 3. e, f, h). There are 171 species of birds that have been identified within the J.B. Thacher and Thompson's Lake BCA, of which 102 are confirmed or probable breeders, including: sharp-shinned hawk (Special Concern), Cooper's hawk (Special Concern), northern goshawk (Special Concern) and golden-winged warbler (Special Concern). The forests support some of the area's highest densities of breeding songbirds such as hermit thrush, winter wren, magnolia, black-throated blue, black-throated green, blackburnian, Canada and worm-eating warblers and Louisiana and northern waterthrushes. J. B. Thacher supported the first recent regional nesting of common ravens and is now the nucleus for the population in the area.

Critical Habitat Types: The BCA contains about 1,400 acres of upland forest with hemlock-northern hardwood predominating; also contains maple-basswood and successional northern hardwoods. Significant ecological community types include 3700 meters of calcareous cliff community. The bur oak-black ash swamp at Thompson's Lake appears to be a variant of red maple-hardwood swamp. Other habitat types include successional old field, emergent marsh and shrub swamp.

Since the designation was made (in 2004) various new properties have been added to these parks. These areas were not evaluated for BCA designation at that time. New information on these properties indicates that a change to the BCA is appropriate at this time in conjunction with the master planning effort.

Alternatives Considered

(i) Status Quo – no changes to current BCA designation

Considerations

- New property added since the 2004 designation will not be added to the BCA
- Existing BCA is fragmented and does not account for actual bird behavior in the environment

(ii) Designate all of the park as a BCA

Considerations

- BCA will include new properties added since 2004
- Eliminates fragmentation of the BCA
- Recognizes that more developed areas are also important for overall bird conservation
- This will provide statewide recognition of the parks as a whole
- Site specific recommendations for the different areas of the park will be developed as part of the BCA-required Management Guidance Summary.

Preferred Alternative

The preferred alternative is (ii) Designate all of the park as a BCA. This alternative provides the opportunity for continued recognition of the park and new acquisitions as an important habitat for resident and migratory bird populations. This alternative also most easily responds to the best examples of bird habitat and responds to changes that may occur through natural processes. This alternative also recognizes that areas of the park that have been altered for intensive patron recreation and park operations still provide habitat and resources for many bird species, and therefore these areas should also be included as part of the BCA, with specific recommendations in the Management Guidance Summary (Appendix E) to address the dual nature of these areas.

Invasive Species

Background

A statewide invasive species control program (ISCP) has been established in OPRHP with goals to preserve biodiversity and reduce the threat of invasive species to the quality of the natural, recreational, cultural, and interpretive resources within state parkland.

OPRHP staff have identified several invasive species present in the park and have made recommendations for the management of these species. Table 3 indicates the species, the status of that species in the park and the management recommendations from OPRHP staff.

Table 4 Invasive Species in John Boyd Thacher State Park*

Species	Status in Park	Recommendations
Buckthorn (<i>Rhamnus cathartica</i>)	Widespread	Eliminate from areas such as the top of the escarpment. Excavate root system or perform cut-stump herbicide treatment.
Garlic mustard (<i>Alliaria petiolata</i>)	Patchy distribution	Easily removed by hand
Bush honeysuckle (<i>Lonicera sp</i>)	Major component in understory	So widespread that it’s almost becoming naturalized. Excavate in areas where threats to significant communities are possible.
Common reed (<i>Phragmites australis syn communis</i>)	Has a foothold in some wetland areas. Control may not be possible.	So widespread that it’s almost becoming naturalized. Excavate in areas where threats to significant communities are possible. Try to protect Beaver Pond Rd. and Hop Field wetlands.
Purple loostrife (<i>Lythrum salicaria</i>)	In some sections of the park	<i>Galerucella</i> beetles, biological control agents that feed exclusively on purple loosestrife, have been released in the parks.

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Species	Status in Park	Recommendations
Oriental bittersweet (<i>Celastrus orbiculatus</i>)	In early detection phase, not prevalent yet. Mostly at base of escarpment and northern edge of park.	Could be cause of concern for trails at base of escarpment. Remove where causing problems.
Japanese knotweed (<i>Fallopia japonica</i>)	Small patch at old homestead area on Hailes Cave Road.	Can be removed but reinvasion from neighboring properties is likely. Excavate in areas where threats to significant communities are possible.
Multiflora rose (Rosa Multiflora)	Small patch in Beaver Dam Road area.	Remove – potentially damaging Golden Winged Warbler Habitat
Swallowwort (<i>Cynanchum sp</i>)	Small patch found and pulled this year	Check area to see if it has grown back. High on list for Early Detection Rapid Response program
Giant hogweed (<i>Heracleum mantegazzianum</i>)	Not in park yet, but found in Schenectady. Wild parsnip is found in park.	Both plants pose human health risks. Early detection surveys for giant hogweed are warranted - eradicate if found. Wild parsnip is so widespread that it's almost becoming naturalized. Cut/mow in areas where threats to significant communities are possible..
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	Found in Thompson's Lake	Difficult to control, best method is physical removal. Work with DEC and Thompson's Lake Association to develop control measures.
Emerald ash borer (<i>Agrilus planipennis</i>)	Not in park yet but park is inside quarantine area.	Help enforce current NYSDEC firewood transport regulations. State and Federal resource agencies are coordinating the response. If found in park, work with those agencies to follow containment protocol. Biological control agent is being developed.
Asian longhorn beetle (<i>Anoplophora glabripennis</i>)	Not in park	Help enforce current NYSDEC firewood transport regulations. State and Federal resource agencies are coordinating the response. If found in park, work with those agencies to follow containment protocol. Eradication is a possibility.
Hemlock woolly adelgid (<i>Adelges tsugae</i>)	Not in park yet	Poses severe environmental quality risk. Periodic early detection monitoring is warranted.
Wild boar (<i>Sus scrofa</i>)	Not in park yet but reported in Schoharie County.	Poses severe environmental quality risk as well as human health risks. Periodic early detection monitoring is warranted. State and Federal resource agencies are coordinating the response. If found in park, work with those agencies to follow containment protocol.

Species	Status in Park	Recommendations
Zebra mussel (<i>Dreissena polymorpha</i>)	Found along shoreline in Thompson’s Lake	No known control for zebra mussels. Work with DEC for mitigation measures.

*Source: OPRHP staff observations 2012-2013

Alternatives Considered

(i) Status Quo – no changes to current management of invasive species

Considerations:

- Currently invasives are being monitored periodically
- Some species are being detected by OPRHP staff and by public
- Certain species are being removed by volunteers
- There are no measures in place for Early Detection Rapid Response

(ii) Develop comprehensive invasive management plan and follow recommendations of OPRHP staff and biologists

Considerations:

- Continuation of current control measures can continue
- Some invasives are not in the park as of yet but are close by, detecting them as soon as they enter the park is critical in some cases
- Concentrated observation is important for early detection
- Priorities for management can be developed based on assessments of various factors including ease of control, potential environmental impacts, potential infrastructure impacts, and the level of threat to human health.
- Park personnel can work with Agency invasive species team to develop management plan and strategies

Preferred Alternative

The preferred alternative is **(ii) Develop comprehensive invasive management plan and follow recommendations of OPRHP staff and biologists**. Under this alternative the current management protocol can be continued and expanded with new techniques and strategies that will detect and respond to invasive species in a timely basis.

Recreational Resource Development

The Meadow

Background

Removal of the Pool. The central part of Thacher SP (identified on some USGS maps as “Horseshoe”) is the site of the former pool and bathhouse. In this plan it is identified as “The Meadow.” The pool was removed in 2007. The reasons for the pool removal center around two factors.

The first factor was the inherent instability of the geology of the Helderberg Escarpment where the pool was located. The escarpment and the land immediately to the west of it is a Karst formation. As

explained in the Geology section of this document (page 18) the Karst formation is composed of soluble limestone which dissolves away due to the passage of water. This dissolving creates voids in the bedrock. These voids caused innumerable problems of leakage and damaged the structural integrity of the pool. The situation progressed to a state where it was impossible to maintain the pool for the safety of the public.

The second factor was decreasing public use of the pool due to increasing number of community pools and private pools in the surrounding area. Since most of the user population comes from the immediately surrounding communities, less public participated in the park pool and attendance numbers dwindled over the years preceding the pool closing. Thus the decision to close the pool came because it had become both unusable and obsolete.

Current Condition. The area of the former pool and surrounding lawn areas remain largely empty, influenced by the demolition of the pool and bath house. The area is sometimes used for special events. There are picnic areas close by as well as a ball field and parking. The ball field in the central area is perceived by park patrons as used mainly by the Horseshoe II picnic area pavilion renters.

The nearby parking is in need of rehabilitation. Surface decay and vegetation growing in the degraded asphalt are present. The parking lot was designed and installed before protocols involving green practices of stormwater management were developed.

Park Needs. There is a continued need at the park for an area available for special events. The meadow has the potential to be that space given its central location, parking availability, proximity to the escarpment, picnic areas, scenic opportunities and readily available utilities.

One of the park goals as set forth in this master plan includes increasing the active recreation opportunities at the park.

Another form of active recreation that has become very popular recently is ropes challenge courses. The meadow presents a good location for such a course given its central location and the availability of a deep foundation area for the poles in the former pool location.

Strolling along the Escarpment Trail is a regular pastime of visitors to the park. Walking in the park scored above the State average in the recreational needs assessment (Master Plan page 10) indicating that walking for enjoyment is desired by the park patrons from the surrounding area.

Alternatives Considered

(i) Status Quo – no changes to the meadow area

Considerations

- The area will remain the same, undeveloped and not suitable for events, strolling in the park or adding sports fields or ropes challenge courses
- The parking area will not be renovated, the surface will continue to deteriorate and green stormwater management practices will not be installed

(ii) Build a new pool

Considerations

- The bedrock geology is not stable enough to support a pool without extraordinarily extensive maintenance operations which could be used to support other new recreation offerings
- The number of community and private pools in the area have increased, reducing the demand for new public pools

- Day use swimming has been opened at Thompson’s Lake
- This master plan recommends expanding the beach area at Thompson’s Lake to accommodate more day users

(iii) Re purpose the meadow area for recreation

Increasing the recreation opportunities is a major goal of this master plan. The area surrounding the former pool location has been underutilized since the pool’s removal. Re-purposing this area to provide enjoyable active recreation as well as areas for relaxing and enjoying the park is the objective of this alternative.

The new design will include several elements (Figure A):

- A public ropes challenge course at the site of the former pool
- A passive park space surrounding the challenge course with a large lawn area, benches, specimen shade trees and walking paths connecting to nearby picnic areas, the Escarpment Trail, the new Tory Cave Trail and the parking lot
- A new bike path connecting the southern portion of Thacher Park to the northern portion of Thacher Park and over to Thompson’s Lake Campground will pass through this area.
- New event concession facility with water, sewer and electric hookups
- The parking lot will be renovated and upgraded to include tree islands and green stormwater management protocols such as vegetated swales.
- The traffic circle and part of Hailes Cave Road will be removed to reduce unnecessary paving in the park and simplify traffic patterns
- A new full basketball court

Considerations

- This design will provide a large un-programmed space that can be used for premier events
- The condition of the existing parking lot will be improved and will utilize green stormwater practices where possible
- Excess roadway will be removed decreasing impermeable surface area and simplifying traffic patterns
- There will be more walking paths for patron enjoyment and improved opportunities to view the escarpment and connect with other parts of the park
- There will be an increased amount of active recreation opportunities

Preferred Alternative – (iii) Re design the meadow area for recreation

This alternative meets the goals of the park master plan and increases active and passive recreation opportunities for park patrons. The new design also expands the park’s ability to host premier events such as auto, craft, art and agricultural shows. The upgrade of the parking lot is important both as maintenance to the condition of the surfacing and as an upgrade which will incorporate better, up to date, stormwater management.

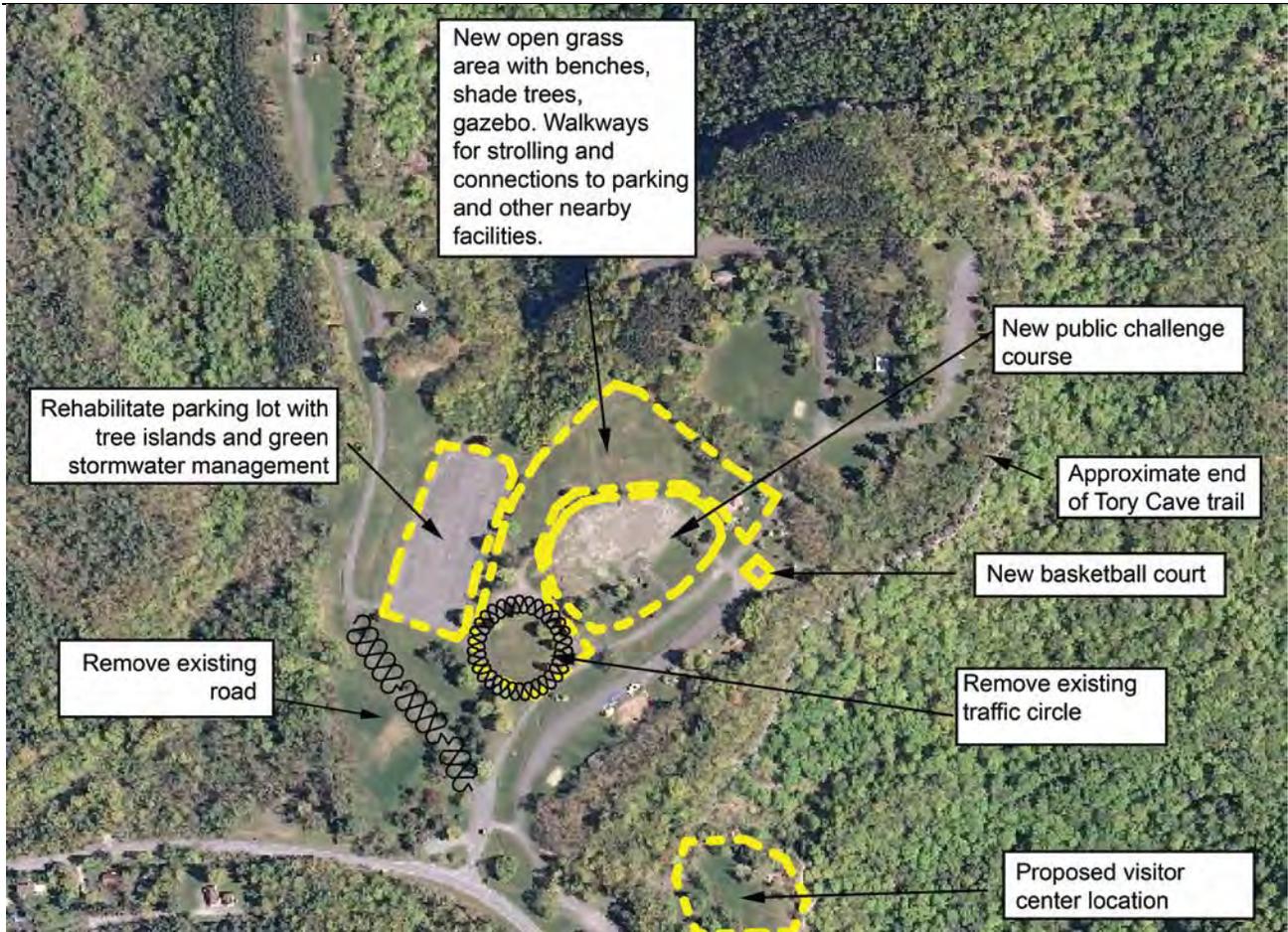


Figure A Conceptual Design For The Meadow

Rock Climbing

Background

New Recreation Activity. The escarpment at John Boyd Thacher State Park presents a possibility of introducing a new recreational activity to the park. The new activity, rock climbing, has been promoted to the Agency by groups of park patrons who have experience in climbing and the desire to make it available at the park. Rock climbing is a permitted activity in New York State Parks. Although currently not allowed at Thacher SP, it is currently a part of the recreation resources in Minnewaska State Park Preserve.

Condition of Bedrock in the Escarpment. The rock in the escarpment at Thacher SP is limestone and shale (see bedrock discussion in Chapter 1 of this document). It is very different from the Shawangunk formation that makes up the bedrock for the climbing routes in Minnewaska. Although limestone cliff faces have been successfully used for climbing routes in other locations, these examples are in climates very different from upstate New York. The climate in this region is considerably wetter, constantly weathering and dissolving the limestone, possibly making it less stable. However, rusting metal anchors used to hold park infrastructure from decades ago have been found still solidly connected to the rock face in several areas.

In general the Manlius limestone layer at the base of the escarpment often presents a face of crumbling rock that easily breaks off under minimal stress. The Coeymans limestone layer, above the Manlius layer and separated by a band of crumbling slate, appears more stable and

conglomerated. By their very nature, the Manlius and slate layers often appear too unstable to provide safe climbing routes while the more conglomerated nature of the Coeymans layer may present more climbing opportunities. However, surveys by OPRHP staff and rock climbing experts have found some areas where the rock face of both the Manlius and Coeymans layers appear more stable and may be suitable for climbing.

In summary, while the rocks of Thacher’s cliffs are not weak shales, nor loose sediments, they do not have the rigidity and “strength” of cliffs in the quartz rocks of the Shawangunks, nor the metamorphosed rocks of the Adirondacks and Hudson Highlands. So the character of Thacher’s rocks need some more attention than in these other areas. (Ver Straeten, 2013)

The limestone bedrock here has also developed into a karst landscape which may bring into question the stability of the cliff face. The karst geology of the area is demonstrated by the abundance of fissures, sinkholes and caves which have formed on top of and behind the escarpment, creating instabilities that may not be seen at the surface. Small, and sometimes large, cliff sections can become dislodged and fall down the slope of the escarpment. The slope leading up to the cliff face is covered in ancient and recent rock falls and there are numerous other examples of this type of cliff face loss known to park personnel and to residents of the surrounding area. It is generally very difficult if not impossible to determine when such random instabilities will result in cliff-face rock failures. Any person engaging in any activity near the edge of the escarpment is at risk if even a minor rock fall occurs. OPRHP cooperates with the local high-angle rescue team to periodically remove obviously loose rock from above the Indian Ladder Trail.

Access. Climbing routes would need to have access points. Most typical climbing areas are accessed from the base of the cliff. Access to climbing areas at the park would have to be on OPRHP property or on land that is under a recreational easement, as it is counter to Agency policy to direct people onto private property. Access to cliffs at Thacher, from the top of the escarpment, poses an uncommon challenge. Access from the top of the escarpment via rappel is not advised due to the lack of tie off anchors and the loose condition of the rock at the cliff edge. Trails would have to be used to give climbers access to the base of the escarpment.

Most likely, as many potential climbing areas are currently not accessible by trail, this would require the creation of specific trails for access to climbing areas. Climbers would have to descend a trail in order to access climbing and would then have to ascend the trail to leave the area.

Alternatively, some access routes might use existing park trails, such as the Indian Ladder Trail or the new Tory Cave Trail. This could cause use conflicts and pose some risk of falling rocks to those patrons on the trails below the climbing routes. It could also pose a problem for climbers, who would likely need to store gear at the base of the cliff, presumably along the trail where it could be damaged by passersby.

Endangered Species. Some areas of the cliff face are habitat to a population of endangered plant. There are also caves which harbor bats.

On Site Assessment. Members of the core planning team and other OPRHP staff have made tours of the escarpment in order to assess the possibility of rock climbing in light of these constraints. Their assessments have identified several areas where climbing may be possible.

Alternatives Considered

(i) Status Quo – no rock climbing allowed

Considerations

- This alternative does not require park employees to implement a rock climbing program
- It does not increase the risk to (some) patrons that may accompany rock climbing activities
- Does not take into account the demonstrated desire by some park patrons for climbing within the park
- Does not support the new park vision to offer new and desired recreation activities

(ii) Allow rock climbing by permit throughout the park

Considerations

- Opens up a major new and desired recreation activity at the park
- Some areas of the limestone cliff face may be too fragile to support climbing
- Some areas of the cliff face are habitat for endangered plant species
- Access to some areas of the cliff face is severely limited by steep slopes, unstable rock, and/or a lack of complete state ownership of the best access route

(iii) Allow rock climbing, by permit, on specific areas of the escarpment, produce a climbing management plan and Memorandum of Understanding with local rock climbing group.

Considerations

- Opens up a major new and desired recreation activity at the park
- Information about stability of rock face, presence of endangered species and availability of access points will aid in determining areas of the escarpment suitable for climbing
- Cliff face areas containing habitat for endangered plant species would be protected
- Hailes Cave bat hibernaculum would be protected
- Local partnerships could be developed to establish viable, safe, legal access routes
- Climbing areas and hiking areas could be designated so as to best avoid potential recreational user conflicts
- Management plan will deal with operational issues, climbing routes (taking into account rock face stability, accessibility and endangered species), access, permits, ice climbing etc.
- Memorandum of Understanding will provide for climbing expertise to manage climbing routes and access

Preferred Alternative – (iii) Allow rock climbing by permit on specific areas of the escarpment, produce a climbing management plan and an MOU with local rock climbing group.

This alternative allows the introduction of a new and popular recreation activity in the park in a way that provides for mitigation of some concerns. All routes will be assessed for rock stability and endangered plant species before allowing climbing in any area. Only those areas with safe and legal access will be used. A management plan will be produced which will define responsibilities for operations of the climbing program, establish procedures for permitting and locate access points for climbing routes. An MOU will be developed with local experts to aid in the establishment of appropriate climbing routes and develop safe access trails.

High Ropes Adventure Course

Background

High ropes courses (or challenge or adventure courses as they are sometimes called) have become extremely popular in recent years. These facilities provide active recreation and a testing of the

participants skills and strengths. There are several organizations and providers who build, maintain and run these types of recreational resources.

Thacher State Park has several picnic areas that have become increasingly underutilized and have the topography and vegetation that may be conducive to the development of a high ropes course.

Alternatives Considered

(i) Status Quo – no new adventure course would be built at the park, all picnic areas will continue to be a publicly rented facilities

This alternative was not preferred because it does not contribute to new recreation resources which is a goal of the master plan. This alternative does not try to fix the under-utilization of some park picnic areas. This is contrary to the goal of streamlining park operations and infrastructure to improve efficiency.

(ii) Design and install a high ropes type challenge course run by the park at Yellow Rock picnic area

Considerations:

- Provides new recreation experiences for the park patrons
- Creates a management challenge for the park staff
- New staff would be needed who are trained in ropes course management
- Utilizes a currently under-utilized area of the park
- Assessment of the natural resources of the area will be needed
- New processes would need to be developed to maintain and operate this facility.

(iii) Solicit proposals from concessionaires to design, install and run a high ropes type challenge course at a location in the park.

Considerations:

- Provides new recreation experiences for park patrons
- Possibility to utilize a currently under-utilized picnic area
- Yellow Rocks area seems to be most appropriate, but other areas could be options based on future proposals
- Less expectations for park staff to be educated in challenge course management
- Assessment of the natural resources of the area will be needed
- Concessionaire would be responsible for all construction, maintenance and operations

Preferred Alternative – (iii) Solicit proposals from concessionaires to design, install and run a high ropes type challenge course at a location in the park

This is the preferred alternative because it meets several of the goals of the master plan, such as providing recreation resources to park patrons and streamlining the management and infrastructure. It also provides a source of expertise for running the facility. By providing several locations for a concessionaire to choose from, this alternative provides for the best choice and an opportunity to utilize an under-utilized area.

Re-Design the Glen Doone picnic area

Background

The Glen Doone picnic area is the most popular picnic area for rentals in the park. The area is highly desired for weddings and other family celebrations. This popularity is due to the outstanding view it has in addition to ample parking, pavilion, room for a large event tent and relative privacy.

This popularity notwithstanding, the picnic area has several issues which would improve the visitor experience and its viability for rentals:

- Existing concession building is not used and in need of upgrading
- Lower parking lot is seldom used
- Pavilion is too small for large parties and view is blocked by vegetation
- Far end of area has no water or electricity
- No playground near upper parking lot
- Circulation needs improving (vehicular and pedestrian)
- Trailhead to Yellow Rocks needs improving
- Comfort station may need to be moved
- Patrons need to rent tent in case of inclement weather



Figure B Glen Doone Picnic Area Existing Conditions

Alternatives Considered

(i) Status Quo – no changes would be made to Glen Doone Picnic Area

Considerations:

- Current issues would not be resolved

(ii) Concept A – some changes made to Glen Doone Picnic Area

Considerations:

- Concept Highlights:
 - Expand existing pavilion
 - Rehabilitate existing comfort station
 - Replace existing playground with a naturalistic playground near upper parking lot
 - Rehabilitate concession building and patio
- Does not eliminate lower parking area
- Retains lawn area for rental tents
- Pavilion and comfort station remain where they are
- Concession stand rehabilitated for park patron use
- Water and electric needed at rehabilitated concession stand

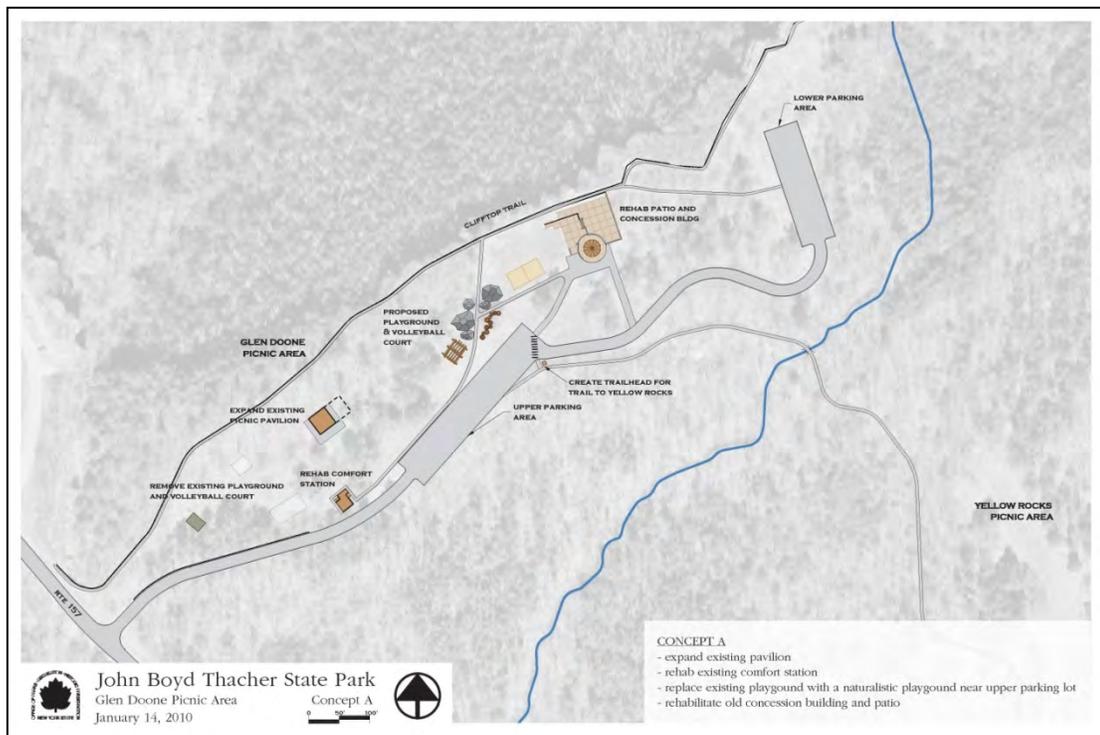


Figure C Glen Doone Picnic Area - Concept A

(iii) Concept B – some changes made to Glen Doone Picnic Area

Considerations:

- Concept Highlights:
 - Existing pavilion to remain with view cleared
 - Rehabilitate existing comfort station
 - Build new comfort station
 - Rehabilitate concession stand and patio
 - Build roof over patio
 - Replace existing playground with a naturalistic playground near the upper parking lot

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- Improves view from pavilion
- Allows for rain cover over patio
- Retains lawn area for rental tents
- Improves concession stand building for patron use
- Retains under used lower parking lot
- Water and electric needed at new comfort station

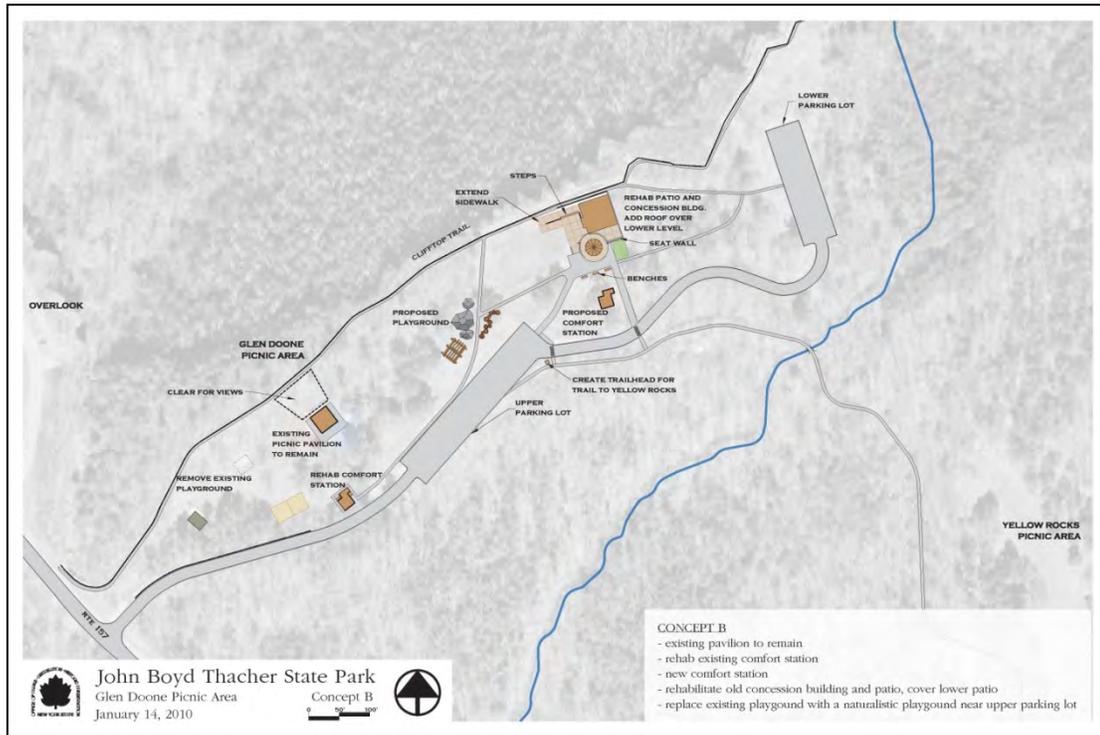


Figure D Glen Doone Picnic Area - Concept B

(iv) ***Concept C – some changes to Glen Doone Picnic Area***

Considerations:

- Concept Highlights:
 - Remove existing comfort station and relocate pavilion to lower parking lot
 - Replace existing playground with a naturalistic playground near upper parking lot
 - Rehabilitate old concession building and patio
 - Build new comfort station to be shared by picnic areas
 - Build new picnic pavilion near viewing area and patio
- Water and electric would need to be brought to new comfort station and concession stand
- Possible conflicting uses if both pavilion and lawn area are used at the same time by different parties
- Leaves lawn area available for rental tents
- May improve use of lower parking lot
- May eliminate need for patron tent rental

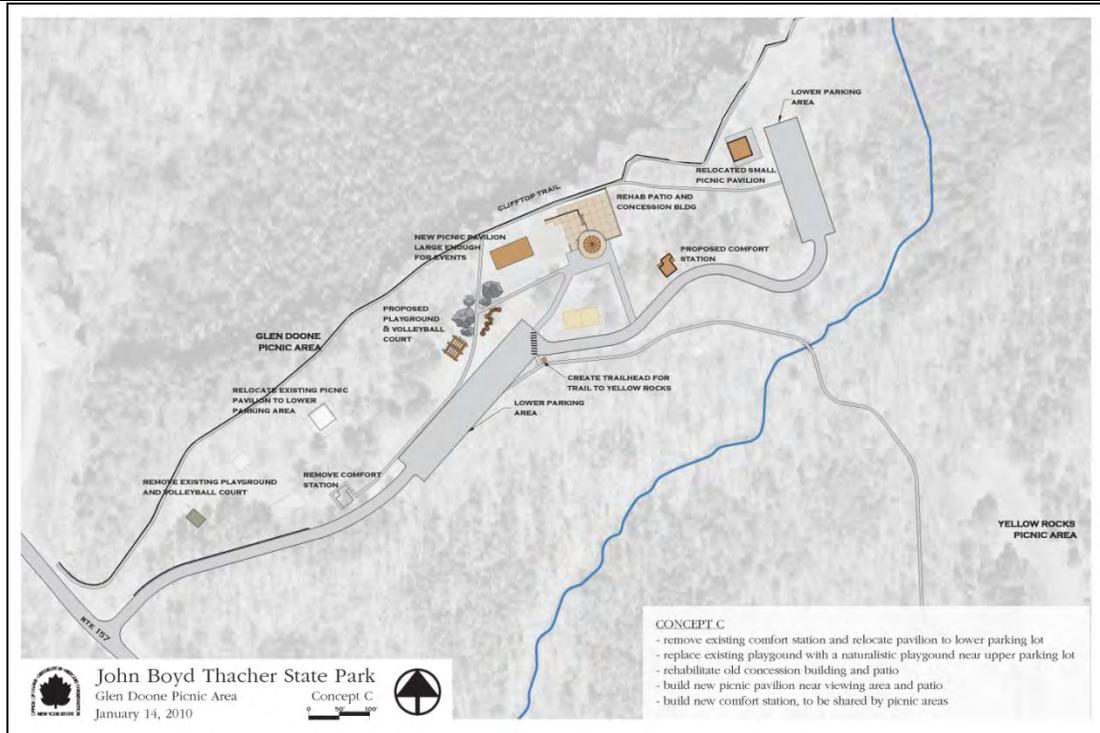


Figure E Glen Doone Picnic Area - Concept C

(v) Addendum to Concept A and B – remove lower parking lot when it becomes deteriorated

Considerations:

- The lower lot is currently in good shape
- Cannot be added to Concept C because of new proposed pavilion location
- The underused parking area would not be removed until it becomes a maintenance problem
- Some impervious surface would be removed at that time

Preferred Alternative – (iii) and (v) Make some changes to Glen Doone picnic area and remove lower parking lot when it becomes deteriorated

This alternative was chosen because it answers many of the issue involved in the current conditions at the picnic area while retaining much of the flexibility for renters. The main viewing area lawn will still be available for tent rentals, and now with another covered area nearby. The concession stand will be rehabilitated and can be used by rental parties as a bar area. The new playground will be larger and closer to the main viewing area. The existing pavilion will remain the same but its view will be improved with some vegetation removal. The lower parking lot is in good shape and can be retained until its life expectancy is over and rehabilitation is needed. At that time it will be removed and the area restored to natural conditions eliminating maintenance of an underutilized area as well as improving drainage by removing impervious surface.

Cave Management

Background

There are many caves at the park. These numerous caves are a natural occurrence in karst landscapes due to water movement through the limestone which dissolves away the rock and contributes to cave formation. A comprehensive map of the location and courses of the caves in the park has not been done at this point. Recently a group of cave enthusiasts has made a proposal to volunteer to map the caves in the park. This would map not only the location of the access points but also the configuration of individual caves where possible.

Caves at the park are also used by bats as hibernacula. Some of these bats belong to endangered species and some have contracted the “White Nose Syndrome” which has been a deadly plague to North American bats. (See page 22 in Chapter 1 of this document for a more complete discussion) To protect bats from human interference a proposal has been made in the past to gate Haile’s Cave with a specially designed bat gate that would allow bats to pass in and out of the cave but prevent humans from entering except by special permit.

Alternatives Considered

(i) Status Quo – no changes to cave management in the park

Considerations:

- Information on location and configuration of the caves at the park will continue to be limited
- Human/bat interaction will be unmonitored and uncontrolled
- No caving will be allowed as a recreational activity

(ii) Allow volunteer group to map caves at the park, install bat gate at Haile’s Cave and institute caving by permit under controlled guided tours.

Considerations:

- Cave locations and configurations will be known. This will be good for safety as well as scientific research at the park
- Human/bat interaction will be controlled and monitored through the use of the bat gate and the permit system
- Volunteers are willing to map the caves and lead permitted tours of those that are accessible to the public
- No general caving will be allowed in the park, only those on guided tours or as part of the volunteer mapping project

Preferred Alternative – (ii) – Allow volunteer group to map caves at the park, install bat gate at Haile’s Cave and institute caving by permit under controlled guided tours.

This alternative was chosen because it fits with the master plan goals. It also improves public safety and protects the native bat population of the park.

Trails

Background

The trail system at Thacher State Park includes approximately 31.4 miles of designated trails accommodating a variety of trail uses including hiking, mountain biking, snowshoeing, cross-country skiing and/or snowmobiling. See Figure 12 – Existing Trail System. Designated trails are defined generally as trails that are named, marked and maintained for specific uses. The system includes both single-use trails (hiking only) and multi-use trails (hiking and biking). Winter uses vary throughout the trail system. Trails include both singletrack (narrow gauge) and wider doubletrack (road-like) trails that weave through the diversity of ecological communities in the park providing a variety of trail experiences.

Trails in the campground area are designated for hiking, cross-country skiing and snowshoeing. These trails also provide connections between the Emma Treadwell Thacher Nature Center the campground and the beach area. Bicycles and snowmobiles are prohibited on these trails. The campground trail system is connected to the main park trail systems via the Salisbury Trail which runs across land owned by the Patroon Land Foundation. The public is currently allowed hiking access along this 0.69 mile trail through an easement from the Open Space Conservancy.

Trail assessments were conducted on all trails throughout the park to identify wet areas, areas of erosion, obstacles in the tread way and missing blazes and signage. See Figure 13 – Trails Assessments. Although much of the trail system was found to be in good condition, some trails were noted as exceptionally wet likely due to their location in generally flat areas with a lack of drainage. There were a number of areas noted with significant erosion due to the alignment of the trail and water flow. Multiple connector and undesignated remnant trails were noted. Trails were generally blazed appropriately; some trailheads were noted as lacking sufficient signage. These types of conditions can reduce the quality of the user experience, cause safety issues, and potentially have negative impacts on park resources. Although there is sporadic signage regarding allowed trail uses throughout the trail system, there was a need to analyze trail uses and designate uses for the entire trail system. A need to enhance trail accessibility along the trail system was also identified during assessments.

Interpretation along the trails is available in the form of interpretive signs and kiosks at a few locations. Outdoor interpretive programs that utilize the trail system are also offered. There is a great opportunity to further interpret the natural, cultural and historic resources of the parks and area.

Note: In addition to the alternatives presented below, some trail activities will not change significantly from the present conditions and therefore do not require alternatives analysis. These activities are hiking, mountain biking, cross country skiing, and snowshoeing. They are described more fully in the accompanying master plan document.

Alternatives Considered

(i) Status Quo – no changes to the trail system

Considerations

- The trail system will remain as is.
- User experience is diminished due to conditions of various trails and minimal signage.
- Trail use may continue to negatively impact natural resources.

(ii) Modify the existing trail system

Modifications of the trail system will include (Figures 14 and 15):

- Realign/reblaze several trails
- Reroute or upgrade trails or sections of trails that are often wet, muddy or highly eroded; some sections will be replaced with sustainably built single track trails
- Designate specific uses for each trail
- Close and restore various connector and remnant trails
- Develop the Tory Cave Trail extending north from the Indian Ladder Trail to connect to the Horseshoe I picnic area.
- Develop a short trail down Helmes Crevice and platform to provide visual access of Hailes Cave
- Extend the Escarpment Trail southeast along the top of the escarpment to Greenhouse picnic area
- Develop a 4.5 mile bike path (accessible to the extent feasible) connecting Thacher and Thompson's Lake SPs along mostly existing trails including the Salisbury Trail
- Enhance access to park resources along trails such as scenic vistas, the escarpment and its geologic formations, wetlands, and other water resources
- Improve accessibility of the trail system including paving a portion of the Escarpment Trail and developing accessible routes to destination locations including multiple waterfalls
- Enhance trailhead and intersection signage along trails and directional signage along roadways indicating access points to the parks and trail system
- Enhance interpretation throughout the trail system to highlight natural, cultural and historic resources
- Explore external trail connections with adjoining landowners
- Expand partnerships with local organizations and user groups for development, maintenance, and monitoring of the trail system

Considerations

- Improves the organization of the trail system and increases trail use opportunities.
- Provides better connectivity between park facilities.
- Provides more and appropriate access to park resources.
- Enhances the visitor experience.
- Improves accessibility of the trail system and the park.
- Creates some larger trail-less areas within certain areas of the park.
- Reduces negative impacts to natural resources of the park.
- Enhances visitor education about natural, cultural and historic resources of the park.
- Improves the structural sustainability of the trails, requiring less maintenance over time.

- Requires staff time and substantial funding in some cases.

Preferred Alternative – (ii) Modify the existing trail system

This is the preferred alternative because it enhances the quality of the visitor experience and safety of park patrons while better protecting the resources of the park. Figures 14 and 15 depict the Trails Plan. The trail system will continue to accommodate hiking, biking, snowshoeing, cross-country skiing and snowmobiling. The Long Path route will be slightly modified in southern Thacher due to trail reroutes. General trail maintenance will continue along with the listed modifications. Details about implementation of this alternative can be found in Appendix A – Trail System Implementation.

The master plan calls for introduction of rock climbing to selected parts of the escarpment area. As further assessments occur and specific locations are identified, climber access only trails may be developed. These would not be open for general public use. In some cases, climber access trails may co-align with existing designated trails and support both general public use and climbers.

Mountain Biking Skills Park and Trail Network

Background

Mountain biking skills parks are growing in popularity as a controlled environment where people can learn to ride a mountain bike and can practice balance and negotiation skills while advancing their skill level (novice, intermediate, advanced). Skills parks contain features that challenge riders of all ages and abilities and create a safer, more experienced riding community. Oftentimes, a skills park has a connected looped trail system that provides novice, intermediate and advanced trail experiences both in trail layout and design as well as trail technical features. These trails and features provide riders with opportunities to further enhance their biking skills.

There are no existing mountain biking skills parks in the region.

Alternatives Considered

(i) Status Quo – no new mountain biking skills park is developed

Considerations:

- Mountain biking opportunities in the park remain as is with the above noted modifications to the trail system.

(ii) Design and install a mountain biking skills park and looped trail system with trail technical features

Considerations:

- Provides a new recreational experience for park patrons that is not currently available in the park or region
- Provides an area where people of all ages can develop and hone riding skills including balance and negotiation creating a more experienced riding community
- Requires resources for planning, design, construction and on-going maintenance

Preferred Alternative – (ii) Design and install a mountain biking skills park and looped trail system with trail technical features

This is the preferred alternative because it meets the goal of providing new recreation opportunities in the park. The area near the Carrick Road Trailhead in the northern part of the Park has been identified as a potential location for development. This area has some existing singletrack trails and is currently used by mountain bikers. Sections of existing trails can be incorporated into the design of the looped trail system. Park management will work with staff and local mountain biking groups who have expertise in this area to further assess the location and design and develop the skills park and looped trails with features.

Horseback Riding

Background

The existing trail system currently informally allows horseback riding in the northern section of Thacher. There are a few locals equestrians who take advantage of this opportunity. There are no designated trails for horseback riding. Despite the 5.68 out of 10 rating of the Relative Index of Needs for Equine Activities (Table 1) for this region, there has been little demand.

Trail assessments conducted during the master plan process noted that on several trails there was tread damage from horse hooves creating deep holes. While some sections of trails are bedrock or are improved to road like conditions, most are natural surface trails. A review of the soil types in this area showed mostly silt loams.

Alternatives Considered

(i) Status Quo – horseback riding is allowed informally in northern Thacher
Considerations

- Accommodates small amount of local use
- Impacts to trail surface continue to deteriorate tread
- Post holes negatively impact other users and are a safety hazard
- Does not conform to goal of designating trail uses for each trail

(ii) Horseback riding is designated for improved surface trails only
Considerations

- Modified trail system provides approximately 3.3 miles of designated improved surface trails in an-out-and back fashion but none are of significant length without improvements to other existing trails
- Five miles of horse trails is considered a minimum trail length to accommodate an equestrian trail ride and none of the improved trails meet that minimum
- Significant public demand is not apparent
- Other existing opportunities for horseback riding exist in the region including the Albany Pine Bush, Partridge Run Wildlife Management Area, and Grafton Lakes SP.

(iii) No trails will be designated for equestrian use.
Considerations

- Lack of demand does not warrant the resources required to significantly upgrade tread surfaces needed to support horseback riding

Preferred Alternative – (iii) No trails will be designated for equestrian use.

This is the preferred alternative due to a combination of existing limitations of soil conditions, and lack of significant demand

Horseback riding was not considered for southern Thacher due to the higher use of this area and its proximity to Route 157. Also, it was not considered for the campground due to the desire to retain a hiking only trail experience in this vicinity.

Snowmobiling

Background

Snowmobiling is currently allowed on wider trails in Thacher SP. Some trails are groomed for winter use when park resources allow. Most snowmobiling in the park appears to be local use from adjacent roads or land. There is parking space available for snowmobile trailers at the Paint Mine and Carrick Road trailheads.

Snowmobiling is not allowed at the campground due to narrow trail widths, minimal trail mileage and the desire to maintain this area for hiking only use.

Through analysis of the trail system at Thacher, several trail reroutes and trail rehabilitations were discussed along with the opportunity to create an area of southern Thacher for non-motorized use only, thereby meeting preservation goals. These alternatives would potentially impact snowmobile trail use.

Alternatives Considered

(i) Status Quo – snowmobiling is allowed on wider trails in Thacher

Considerations

- Snowmobile use continues to be accommodated in the park
- Some trails in southern Thacher used by snowmobiles are wide, flat and muddy and are negatively impacting the natural resources and the user experience during the majority of the year

(ii) Snowmobile trail mileage in southern Thacher is reduced due to trail system upgrades

Considerations

- Snowmobile use continues to be accommodated in the park
- Trail system upgrades (including the development of sustainable singletrack trails for reroutes of various trails and trail closures and rehabilitation) reduce negative impacts to natural resources
- Trail system upgrades improve visitor safety and experience
- Reduces maintenance time and costs
- A non-motorized trail use area is created in southern Thacher surrounding portions of the Onondaga Escarpment, a significant feature to wildlife in the area
- Enhances preservation efforts

Preferred Alternative – (ii) Snowmobile trail mileage is reduced due to trail system upgrades

This is the preferred alternative due to the desire to develop a more sustainable trail system, reduce motorized impacts in one area of the park but still accommodate snowmobiling. As shown on Figure 16, snowmobiling will continue to be allowed along the main north-south corridor from Paint Mine to the trail south of Beaver Dam Road and north from Paint Mine to connect to northern Thacher. Snowmobile trailer parking will remain available as is, as this was deemed to be sufficient to accommodate use.

Although the snowmobile trails at Thacher are not currently connected with the statewide snowmobile system, park management will continue to work with local snowmobile clubs and adjacent landowners for external trail connections as appropriate.

Campground Expansion

Background

The campground at JB Thacher SP has one of the highest overall occupancy rates in the State. The need for additional camping in the capital district is supported by the results of studies and analyses undertaken by OPRHP. These factors combine to indicate that additional camping sites at the Thompson's Lake SP campground would benefit the recreation offerings of the park in a location that is already a popular camping location.

It has also been noted, through surveys of campers, that there is some demand for campsites that provide electric service. There are currently no electrified campsites at the campground.

The wooded area to the north of the current camping loops provides ample space for additional camp sites but is also an area where environmental education hikes are conducted by staff from the Nature Center.

Alternatives Considered

(i) Status Quo – No new campsites or electrification of existing sites

Considerations

- No new capacity for additional camping at the park
- Patron desire for electrified sites will not be met

(ii) Build new full service campsites with new bathhouse north of existing camping loops

Considerations

- Meets the master plan goal of providing and expanding recreation opportunities at the park
- Satisfies patron requests for electrified campsites
- Buffering will be needed to mitigate noise and visual impacts to environmental education trail with native plant buffers to be designed and installed concurrently with new campsites
- Roadways, campsites and trenching for electric service will impact vegetation
- New bathhouse will be hooked into existing water supply and waste water treatment plant

(iii) Build new tent campsites with new bathhouse north of existing camping loops

Considerations

- Meets the master plan goal of providing and expanding recreation opportunities at the park
- Campsites will be smaller than full service campsites and will primarily accommodate tent camping
- The tent campsites will not be electrified
- Visual impacts will not be as significant as with full service campsites but will still need some buffering from environmental education trail with native plant buffers to be designed and installed concurrently with new campsites
- New bathhouse will be hooked into existing water supply and waste water treatment plant

(iv) ***Electrify selected existing campsites in “A” loop***

Considerations

- Satisfies requests from patrons for electrified campsites
- Offers improved facilities to park patrons
- Increases the range of types of campsite offered at the park
- Requires trenching and some temporary ground disturbance

Preferred Alternative – (iii) and (iv) Build new tent campsites with new bathhouse north of existing camping loops and electrify selected existing campsites in “A” loop

This is the preferred alternative because it combines satisfying patron requests for electrified campsites, the goals of the master plan for expanding recreation offerings and protection of an existing environmental education program.

Impacts to the program and to existing undisturbed vegetation will be minimized through the reduced size of the campsites, the vegetated buffer and by locating facilities on site with sensitivity to these factors.

The decision to provide electric service at selected sites in the existing camping loop “A” will suit campers while limiting trenching and ground disturbance to already developed areas of the park.

Thompson’s Lake Beach

Background

The beach at Thompson’s Lake SP was originally conceived to be used by patrons who were camping there. After the closing of the pool at Thacher SP the beach was opened to day users as well. Thompson’s Lake is a very desirable swimming location due to the high water quality and the sandy beach which has been installed and kept up by the park staff. The popularity of this location is already resulting in crowded conditions on the beach during peak periods. It is anticipated that with the additional campsites being built there will be further and more significant crowded conditions.

The design standards put forth by the New York State Department of Health (Public Health Law section 225, subpart 6-2.19 (4.4)) sets the allowed density at 35 square feet of beach area per person. The current beach is approximately 4,110 square feet giving a maximum patron number of 117. Meanwhile, the swimming area is approximately 13,500 square feet, yielding a bather capacity of 344 persons according to NYS DOH regulations. This means that 227 more people are allowed in the water than are allowed on the beach.

The area to the south of the current beach is wetland, therefore no expansion can occur in that direction. The area to the north of the existing beach is available for expansion to the property line.

Parking is also a concern at the beach. Day users have limited parking available.

The alternatives will deal with both the expansion of the beach itself and installation of additional parking spaces for day use.

Alternatives Considered

(i) Status Quo – no changes

Considerations

- Beach will remain crowded on peak days and may experience more significant crowding after addition of new campsites
- May exceed allowable density of users at times of peak usage
- Parking will continue to be problematic for day users
- Does not meet the goals of the master plan in providing improved recreation resources for park patrons

(ii) Expand sandy beach north to the drainage ditch or property line

Considerations

- Some vegetation (grass, small herbaceous plants and small trees) will need to be removed
- Additional sand to be trucked in and spread
- Expansion will add an additional 1,350 square feet and room for 38 additional patrons
- Determination of northern end of beach will be made on site

(iii) Eliminate two existing campsites across the road from the beach and add beach parking spaces

Considerations

- Current parking is inadequate for beach day users
- Will reduce camping spaces
- Will increase and improve parking situation for day users

Preferred Alternative – (ii) and (iii) Expand sandy beach north to the drainage ditch or property line and eliminate two existing campsites across from the beach and add beach parking spaces

This alternative was chosen because it reduces crowding at the beach, by adding new beach area, and parking problems for day users. No expansion of the swimming area itself is needed or contemplated at this time.

Basketball Court

Background

Addition of new recreation opportunities at the park is a goal of the master plan.

There is currently one makeshift basketball court on the parking area of the Pear Orchard parking lot. New standard basketball courts have been desired by the public in an easily accessible location.

Alternatives Considered

(i) Status Quo – no changes

Considerations:

- No addition of recreation opportunities at the park
- Basketball would continue to be available only at the makeshift court on the Pear Orchard parking lot

(ii) Convert existing makeshift basketball court at Pear Orchard parking to new full basketball court (see Figure A)

Considerations:

- Would be part of the Meadow renovation
- Fills public desire in the park
- Utilizes existing area

Preferred Alternative

The preferred alternative is ***(ii) Convert existing makeshift basketball court at Pear Orchard parking to new full basketball court***. This alternative was chosen because it meets the master plan goal of adding recreation opportunities to the park.

Facilities and Operations

Visitor Center

Background

The planning team determined that a new multi-purpose facility is needed at John Boyd Thacher State Park. The current park office does not meet the needs of the visiting public and needs to be replaced with a facility that will provide improvements to visitor orientation, interpretation, amenities and community uses. This facility will also include a space for exhibits of park geology, provide a meeting space, park offices, indoor event rental space, restrooms and serve as a warming hut in the winter.

It was also determined that in order to further serve the needs of the park and park patrons the new facility should

- Be placed in a location in Thacher Park that takes advantage of the view from the escarpment as well as which can be seen from Route 157
- Have no or minimal impact to the view of the escarpment from off site
- Have no or minimal impact from lighting

Alternatives Considered

(i) Status Quo - No new Visitor Center will be built.

This alternative was considered by the planning team and was deemed not acceptable because it does not contribute to fulfilling the park vision nor does it provide a needed new park office.

(ii) Build a new Visitor Center/Park Office/Geology Museum at the Indian Ladder Picnic area.

One goal for the park centers on a new visitor center (see the Master Plan Document). The same facility can be used for other park purposes such as a park office, exhibit space, meeting room, rental space and warming hut. A new visitor will serve to orient visitors and to organize various aspects of the park and its activities.

This location would place the new facility just northwest of the existing parking area. (Figure H)

Programmatic Considerations:

- Building a new facility responds positively to the goals and objectives of the park plan
- Currently the park lacks central organizing facility and does not take advantage of presenting existing resources to park patrons
- Geology is a large part of the history and resources of the park but is not currently interpreted adequately
- Resource for visitor services needs to be improved
- Additional indoor all weather rental space increases season for event rentals
- Current park office is inadequate, does not support managerial functions efficiently

Location Considerations:

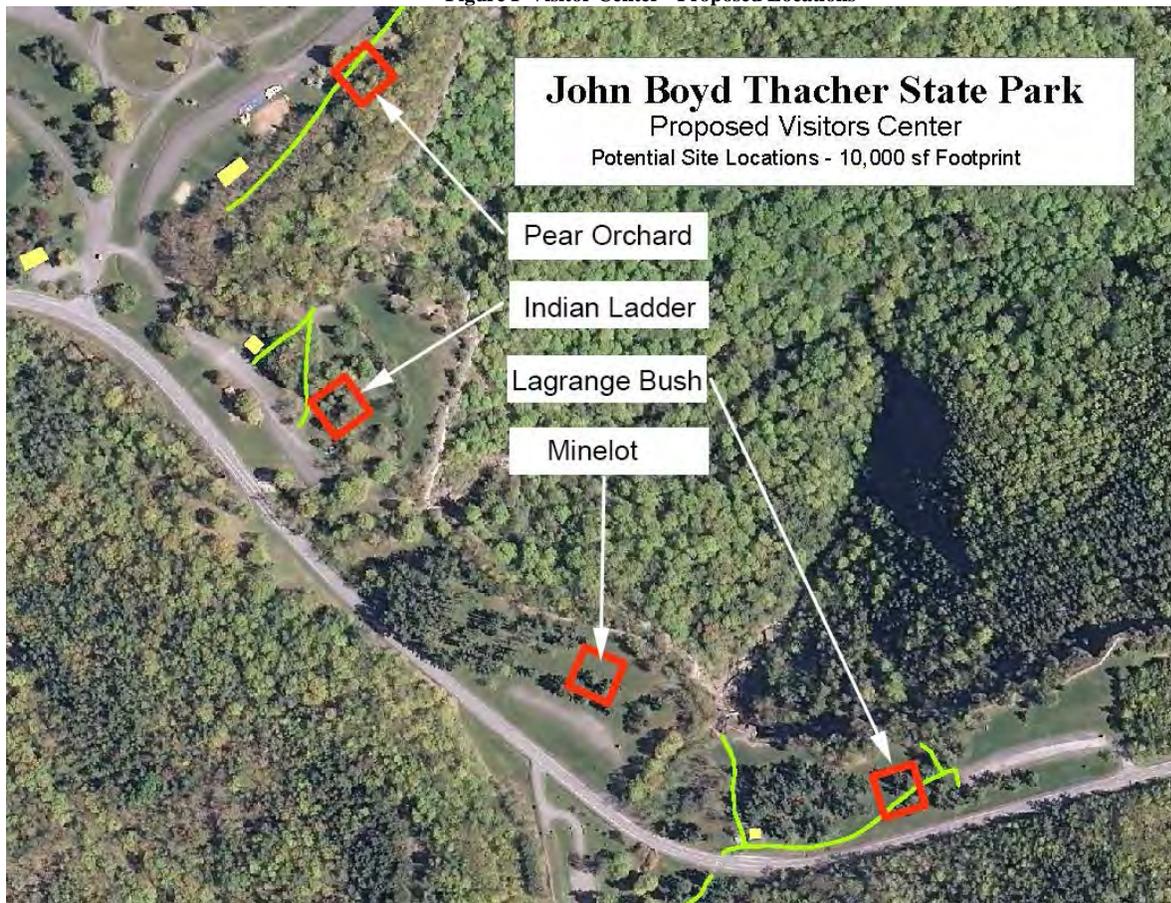
- Gentle terrain with one significant grade change
- Parking is inside the fee area so the toll both will have to be moved or parking reconfigured to allow several short term free parking spaces
- Pay and display will need to be implemented in the parking area
- Footprint of building will fit in this area
- Height of building will need to be controlled to reduce visual impact from off site
- Spectacular view from the escarpment
- Good access to trails
 - Indian Ladder trail
 - Long Path
 - Escarpment Trail
 - Near south terminus of possible future Tory's Cave Trail
- Large lawn area available to continue current use of viewing, picnicking, etc
- There are existing utilities at this site
- Near to "meadow" area
- Central to all park activities
- Existing comfort station will need to be removed, and a new one constructed at Pear Orchard

Preferred Alternative

The preferred alternative is ii, build a new facility at Indian Ladder. This alternative was chosen because the location meets many of the requirements that had been set out by the planning team. Additionally, its proximity to the Indian Ladder trail head is an important factor in making this decision. Visitors to the facility will have the opportunity to access this trail immediately after having learned of the geology of the park in the exhibits. The site also responds well as a location for

a park office and an information center. The escarpment views in this location are spectacular and the facility would be easily seen from Route 157.

Figure F Visitor Center - Proposed Locations



Remove Unused Parking Areas

Background

Several parking areas in the park are not being used or are in locations that are inefficient for their intended purpose. Unused parking areas are not being maintained and present an eyesore to the public as well as a continued impact to soil permeability and stormwater runoff.

Alternatives Considered

(i) Status quo – no changes will be made to existing unused parking areas.

Considerations:

- The parking areas will continue to deteriorate, erosion problems will persist
- Maintenance will continue to be necessary
- Soil compaction and stormwater runoff impacts will continue

(ii) Remove unused parking areas and restore the land to naturalized conditions

Considerations:

- The following parking areas would be removed:
 - Upper Paint Mine (and connector road)
 - Minelot
 - Parking area at south entrance to the park
 - Haile’s Cave parking area (new lot to be moved closer to the pavilion)
- Restoration of natural communities will improve stormwater runoff impacts and lessen erosion problems
- Maintenance would no longer be needed freeing up needed park resources

Preferred Alternative – (ii) Remove unused parking areas and restore the land to naturalized conditions.

This alternative was chosen because it improves conditions at the park, makes the park operations more efficient and eliminates some erosion problems due to stormwater runoff.

Comfort Stations

Background

Many of the existing comfort stations in the park are old and showing signs of decay. Some have problems with carpenter ants and some with dry rot. These comfort stations are also not compliant with current ADA requirements and are energy inefficient due to incandescent lighting or aging fluorescent lighting.

Additionally, the park is undergoing a transition from a central sewage treatment plant to individual septic systems for each comfort station. As this work progresses it is a good time to replace the stations themselves in order to better design them for the new septic systems.

Alternatives Considered

(i) Status Quo – no changes will be made to existing comfort stations

Considerations:

- Comfort stations will continue to have challenges with ADA non-compliance, maintenance concerns, inadequate facilities and energy inefficiencies

(ii) Replace some comfort stations (according to the following table):

Table 5 Comfort Station Changes in alternative (ii)

Location	Decision
Glen Doone II	New microstation with re-design
Hop Field	Replace existing with composting toilet
Knowles Flat	Microstation
Indian Ladder	Replace existing at Visitor Center
Pear Orchard	Add new
Horseshoe II	New microstation
Yellow Rocks	Retain existing
Greenhouse	Retain existing
Paint Mine	Get rid of existing and put new microstation across road to where the pavilion is
Hailes Cave	Get rid of existing and put new microstation across the road
Overlook	Need facilities – new composting toilet or full station
Thompson’s Lake Campground	Eventually needs to be on its own septic. Currently pumping sewage to treatment plant.

Considerations:

- New “Microstations” will be ADA compliant and will be energy efficient
- Maintenance challenges will be lessened with new design
- Moving some comfort station locations will improve patron experience
- New composting toilets will be energy efficient and will eliminate some needs for development of septic systems

Preferred Alternative – (ii) Replace some comfort stations (See Table 4)

This is the preferred alternative because it meets the master plan goal of improving operation efficiency at the park. Additionally it will improve the park patrons’ experience through elimination of un-appealing, aging comfort stations and replacement with new, modern facilities.

Cave Management

Background

There are many caves at the park. These numerous caves are a natural occurrence in karst landscapes due to water movement through the limestone which dissolves away the rock and contributes to cave formation. A comprehensive map of the location and courses of the caves in the park has not been done at this point. Recently a group of cave enthusiasts has made a proposal to volunteer to map the caves in the park. This would map not only the location of the access points but also the configuration of individual caves where possible.

Caves at the park are also used by bats as hibernacula. Some of these bats belong to endangered species and some have contracted the “White Nose Syndrome” which has been a deadly plague to North American bats. To protect bats from human interference a proposal has been made in the past to gate Haile’s Cave with a specially designed bat gate that would allow bats to pass in and out of the cave but prevent humans from entering except by special permit.

Alternatives Considered

(i) Status Quo – no changes to cave management in the park

Considerations:

- Information on location and configuration of the caves at the park will continue to be limited
- Human/bat interaction will be unmonitored and uncontrolled
- No caving will be allowed as a recreational activity

(ii) Allow volunteer group to map caves at the park, install bat gate at Haile's Cave and institute caving by permit under controlled guided tours.

Considerations:

- Cave locations and configurations will be known. This will be good for safety as well as scientific research at the park
- Human/bat interaction will be controlled and monitored through the use of the bat gate and the permit system
- Volunteers are willing to map the caves and lead permitted tours of those that are accessible to the public
- No general caving will be allowed in the park, only those on guided tours or as part of the volunteer mapping project

Preferred Alternative – (ii) – Allow volunteer group to map caves at the park, install bat gate at Haile's Cave and institute caving by permit under controlled guided tours.

This alternative was chosen because it fits with the master plan goals. It also improves public safety and protects the native bat population of the park. The management plan will also use *A National Plan for Assisting States, Federal Agencies and Tribes in Managing White-Nose Syndrome in Bats* and *National White-Nose Syndrome Decontamination Protocol* in developing protocols for bat protection.

Traffic Calming on Route 157

Background

The main road through JB Thacher State Park is New York State Route 157. This road is a well-used public road that connects communities in the Helderberg highlands on top of the escarpment with those below and beyond to the rest of the capital district. The road also connects Thacher park with the campground, the nature center and several local roads.

The presence of a state highway running through the park is not desirable. Speed limits have been reduced on the road where it goes through the park. However, given its design there is little motivation on the part of motorists to observe those limits. This situation can cause several different types of user conflicts.

The most obvious conflict between park users and motorists passing through on 157 is that of pedestrians crossing the highway to get from one part of the park to another. Other conflicts involve vehicles cueing on the road while waiting to enter a parking lot, vehicles exiting parking lots, making left turns or stopping to observe something in the park. Each of these situations presents the possibility of crashes, property damage and injuries.

Route 157 also presents a barrier for wildlife. Individuals that need to get from one side of the park to the other cross the road and risk being struck by motor vehicles. Although the most conspicuous examples of this are large mammals such as deer, raccoons and skunks, smaller animals such as toads, salamanders, mice and etc. are also subject to this kind of injury. In particular, Jefferson's salamanders, a rare species, cross Rt. 157 each year during mass migrations in the spring.

Additionally, accessibility is an issue in the park along the road where pedestrians cross the road and there are no signalized crossings intended for use by visually impaired persons.

Alternatives Considered

(i) Status Quo – no changes to Route 157 in the park

Considerations

- The road will continue in its present configuration
- User conflicts will continue at the current rate
- Animals will continue to cross the road at grade
- No changes to bicycle traffic accommodation
- Does not meet park planning goals of making the park more user friendly
- Accessibility issues will remain

(ii) Work with DOT to reduce traffic/pedestrian conflicts on Route 157 in the park

The type of installation used on Route 157 in the park will vary according to the specific location and will be designed in consultation with New York State Department of Transportation (DOT).

Considerations

- Need cooperation of DOT
- Increase park patron safety
- Design will take into account need for snow removal
- May be able to incorporate tunnels for migration of animals such as toads, snakes salamanders, turtles, mice, and other small and medium sized animals.
- installed at points where patrons are most likely to cross Rt 157 and have conflicts with vehicular traffic
- take into account the ADA requirements

Preferred Alternative – (ii) Work with DOT to reduce traffic/pedestrian conflicts on Route 157 in the park

This is the preferred alternative because it adds to the safety of park patrons. It also improves the park usability to individuals with visual impairments. The addition of protected crossing for small animals will improve the habitat for wildlife as well.

Structures in the Park

Background

Some structures in the park are underutilized or have become dilapidated to the point where they present maintenance and safety concerns.

Alternatives Considered

(i) Status Quo – no changes to unused structures in the park

Considerations:

- The un or underused structure in the park that have safety concerns will not be removed.

(ii) Remove selected structures in the park

Considerations:

- A list of structures to be removed has been developed by the park region
- Removal of these structures will eliminate maintenance and safety concerns and return part of the park to a more natural condition
- Structure to be removed will be:
 - Old manager's house and garage
 - Small building outside former pool area
 - Barn across the street from rental house and horse barn
 - Upper Paint Mine comfort station

Preferred Alternative – (ii) Remove selected structures in the park

This alternative was chosen in consideration of safety and because it meets the master plan goal of improving efficiency of park operations.

Chapter 3 - Selection of the Preferred Alternative

Selecting the Preferred Alternative

Two alternatives are considered in this EIS for further development of the parks.

The first alternative is the Status Quo, where the park will continue as it is with existing natural resource protection, recreational facilities and management and operation. In this alternative no changes would be made to the park to meet current needs of the Agency or of the park patrons.

The second alternative is the master plan alternative. The master plan is the plan of changes in the park which is made up of the combination of all the preferred alternatives for the elements analyzed in Chapter 2. These changes encompass all aspects of the parks including natural resources, recreational resources and management and operations.

The preferred alternative for the park is the master plan alternative as described in the accompanying document.

Rationale for Selection

The core team analyzed the status quo and other alternatives with respect to the park vision and goals which guide changes in the park. Although management and operation of the park continues at a high degree of excellence, some changes are necessary because the park no longer fully serves the original intention of its formation, nor does it meet current recreational needs as completely as it could with some changes, reconfigurations and additions. Staff and patrons have indicated areas where changes and improvements can be made that will enhance the user experience and the variety of recreation options available at the park.

The preferred master plan alternative was chosen because the changes it suggests improve natural resource protection, expand recreational opportunities, and enhance management and operation in ways that support the realization of the park vision and goals.

In choosing the master plan over the status quo, OPRHP is making a commitment to improvements and changes in the park over the next decade, perhaps longer, which will be in the interest of users and staff, and will have a positive impact on recreation and the natural and cultural resources.

Chapter 4 - Environmental Impacts and Mitigation

Introduction

This chapter focuses on the environmental impacts and mitigation of predicted adverse effects resulting from the implementation of the master plan. For the purposes of SEQR compliance, the two documents together (Master Plan and Final Environmental Impact Statement (FEIS)) satisfy the requirements for an environmental impact statement as specified in NYCRR §617, the rules and regulations implementing SEQR. A description of the preferred alternative can be found in the Master Plan document. The environmental setting is discussed in the FEIS Chapter 1. Chapter 2 of this document contains the alternatives analysis and the selection of the preferred alternative.

This chapter has two primary parts: a summary of environmental impacts associated with the alternatives considered, and a more detailed analysis of impacts associated with implementation of the Master Plan, including a discussion of mitigation measures.

Environmental Impacts of the Alternatives

Alternatives were analyzed and developed in Chapter 2 for natural resource protection strategies, recreation development and management support at the park. The analyses and choice of preferred alternatives are based on:

- Information about existing conditions (Chapter 1)
- Consideration of demand for various activities
- Site constraints
- Other considerations as identified in each element resource analyses.

The Final Master Plan consists of the combined preferred alternatives for each identified activity.

Status Quo Alternative

This alternative consists of the current facilities, programs and practices at the parks as described in Chapter 1. Under this alternative, current resource protection, operations, and facility management practices would continue. The increasing and changing recreational demand on the park would not be addressed, nor would existing impacts be mitigated. There would be no opportunity to address conservation of the resources under recent changes to Environmental Conservation Law or Parks Recreation and Historic Preservation Law.

Although the Status Quo alternative may not result in any immediate additional adverse environmental impacts, the potential exists for long-term indirect adverse environmental impacts. This is due to the fact that there would be no plan to guide use, protection or development of the park. If more park visitors seek to use the park, and use it in new or unforeseen ways, additional demands will be placed on the natural, cultural and recreational resources. Without the guidance provided by the Master Plan, which directs more intensive use and development toward areas with capacity for such use and away from the more sensitive areas of the park, the potential for adverse impacts on environmental resources increases.

Without the guidance of an overall trails plan, as included in the Master Plan, trail proposals would occur and be addressed on a case-by-case basis. Undesignated trails would continue to proliferate in areas of the park that might not support such use. Issues such as erosion or the

introduction of invasive species of plants and wildlife into the park would be handled on a case-by-case basis as they arose.

Preferred Alternative – the Final Master Plan

The final master plan is the compilation of all the preferred alternatives for natural resource protection, recreation development and support facility development elements identified in Chapter 2 of the FEIS. This compilation was subject to a final evaluation and synthesis to assure that there was consistency among the various alternatives. The plan will provide considerable resource protection and recreational benefits. From a long-term perspective, implementation of the park master plan will result in a beneficial environmental impact by insuring that recreation development takes place in areas of the park that are appropriate and effective while the most sensitive areas of the park will be identified, monitored and provided appropriate stewardship. Environmental impacts of the master plan are discussed more fully in the rest of this chapter.

Environmental Impacts Associated with Implementation of the Final Master Plan and Proposed Mitigation

The master plan for John Boyd Thacher State Park seeks to provide improvements to existing natural resource protection strategies and recreation development while providing additional protection of sensitive natural resources within the park while providing new and expanded recreational resources. Planning for new facilities in the park reflects this and the proposed location of new or expanded facilities avoids sensitive resources to the extent practicable.

Land (Topography, Geology and Soils)

Implementation of the plan will result in some physical change to the land. This is particularly true where new buildings, camping, recreation facilities, and trails are proposed. In total most of the park will continue to remain as it is before the master plan is implemented. (Table 5)

Table 6 Percentage of Park Land Changed (both parks combined)*

Category	Total Acreage	Total New Developed Acres
Total Combined Park Acreage	2452.6	n/a
Visitor Center		.79
Glen Doone Re-design		.12
New Comfort Stations w/new septic systems		.35
New camping loop (camp sites, roads and comfort station)		1.06
New, relocated and closed trails		(.14) [†]
Removal of parking areas, roads and unused buildings		(1.7)
Net New Acres of Development		.48
Percent of total Park Acreage		.02%

*Source: NYS Natural Heritage Program, OPRHP GIS and Planning Bureaus.

[†]Total acreage of new trails is less than existing

Impacts to land will occur where the master plan calls for new buildings and recreational facilities. Those proposed in the plan include: new comfort stations with septic systems, a new visitor center in the Indian Ladder picnic area, a new basketball court, two new adventure courses, a new park camper registration building near the existing camping area entrance and new campsites in an expanded camping area.

The visitor center and camping area will require some new grading. The proposed location of the visitor center is in a developed, lawned area; the total new grading will total 4,180 square feet or

approximately 0.1 acres. The adventure courses and basketball court will be built in areas that are already disturbed. To minimize the amount of grading that will be needed, site specific design of these facilities will incorporate the existing grade levels where possible.

Potential impacts on land would also result from the construction of new trails, a new mountain bike skills area and relocation of existing trails. The net result of these activities will be a reduction in trail miles of approximately .28 miles. At an average width of 4 feet this means a reduction of .14 acres. These numbers do include the development of a looped trail system in conjunction with development of the mountain biking skills park to be located near the Carrick Road trailhead.

Impacts of trail construction will vary based on the proposed use of the trail, its proposed surfacing, and its location with respect to steep slopes and streams. Disturbance of land will be limited to the required width of the trail corridor. Trail construction will follow the policies and guidelines for trail building that have been established by recognized trail organizations and government agencies. Adherence to these guidelines will assure that work is completed in a manner that maximizes protection of park resources.

As discussed in Appendix B, many of the soils at the parks have limitations for certain types of construction due to shallow depth to bedrock and other factors. (NRCS, 2011). Construction in these areas will be designed to accommodate these factors and will minimize impacts to existing soils.

For the camping expansion in Thompson's Lake SP modifications would include approximately 1.06 acres in new semi-pervious development tent pads, roadway and new contact station facilities.

Overall, most of the park will remain as it is now.

Water

Impact on Lake, Pond and Stream Water Quality. No projects in the Master Plan will have a detrimental impact on water quality in Thompson's Lake, the small pond in the northern section of Thacher Park or any of the stream courses through the park. Erosion and Sediment controls will be installed as needed during construction. There will be a beneficial impact by moving some trails out of wet areas reducing runoff.

No new buildings or facilities are proposed in flood-prone areas within the park.

There will be some beneficial impacts to aquatic invasive plant control in Thompson's Lake through signage, aquatic weed disposal stations in cooperation with DEC and the Thompson's Lake Association.

Impact on Ground Water Quality. In the karst terrain so prevalent at the park, stormwater runoff control is important because the surface runoff can flow deep into the limestone bedrock, possibly affecting the groundwater. Increased stormwater runoff can also affect surface waters such as streams, lakes and ponds by increasing the sediment load and introducing pollutants that are carried by the runoff. Stormwater can also cause erosion and changes to stream habitats. This has a direct effect on the biodiversity of the stream and its corridor.

Stormwater runoff is increased by the addition of impervious surfaces such as building roofs, roadways, trails and parking lots.

Current pavement and impervious surfaces in the park are fairly limited consisting mostly of the major roadways, the picnic and beach parking areas, and park buildings including the pavilions,

park office, and comfort stations. There is no new pavement proposed within the final master plan. Roads and parking for the new Visitor Center will use existing facilities as will the basketball court.

The surface area of new buildings with impervious roofs will include the new Visitor Center, new roof over the Glen Doone patio, a new contact station at the camping entrance, camp pads and roads and a shower building for the camping area. The total maximum acreage of all of these new impervious surfaces is very small, approximately 1.53 acres.

An increase in impervious surfaces could result in an increase in the quantity and velocity of runoff generated during storm events. Permeable materials will be used whenever practical with respect to site conditions, cost and operations. This will be especially for parking areas and for areas that will not need to be plowed in the winter time, such as camping area roads. All new roads and parking areas will have drainage infrastructure designed to mitigate stormwater runoff. Green design will be utilized for the buildings as much as possible. Rain gardens will be installed at the new Visitor Center to help reduce direct runoff into the ground water.

Work on trails including improvements to existing trails and undesignated trails, as well as proposed new trails, have the potential to impact water resources in the park. Standard water abatement techniques will help remediate these concerns. Work on existing trails and closing and restoring undesignated trails will be undertaken using the established guidelines referenced in the Master Plan. Trail areas that require more than routine measures will be identified through the approval process described in the plan and remedies, such as construction of culverts, bridges or boardwalks, will be planned in consultation with regional and park staff. Regional staff will review proposals and consult with NYS Department of Environmental Conservation and/or the US Army Corps of Engineers as appropriate.

At the time of implementation an erosion control plan will be prepared for construction projects proposed in the Master Plan. Any projects that disturb one acre or more will be subject to the State Pollution Discharge Elimination System (SPDES) General Permit process. Best management practices (BMP's) as described in the New York Standards and Specifications for Erosion and Sediment Control (NYS Soil and Water Conservation Committee, 2005) will be used to reduce impacts to soils on the project sites. Some measures which will be used include minimizing soil disturbance and vegetation clearing, the use of silt fencing and straw bales where needed, preservation of vegetated buffers, and seeding and mulching of disturbed areas as soon as possible following work.

During field layout of trails, the Agency will attempt to minimize stream crossings to the extent possible and retain a buffer between new trails and water bodies. All new trail work will be designed to control stormwater and minimize erosion.

Wetlands

There will be positive impacts to the National Inventory wetlands in the park due to relocation of trails that are now in close proximity to them and construction of boardwalks that will remove foot traffic from in the wetland.

Air

Some small impacts may occur from increased travel to use the new visitor center. However, it is expected that the primary users of the visitor center will be park patrons already at the park. Impacts to air quality, are expected to be minor. The new visitor center will utilize the existing Indian Ladder parking area spaces, buses will park in the existing main parking lot and patrons

arriving by bus will walk to the visitor center. Buses will be required to turn off their engines while in the parking lot. There will be an impact to air quality due to the increased use of campfires and vehicle use in the expanded Thompson's Lake camping area.

Other potential air quality impacts as a result of master plan implementation will be minimal. Short term temporary impacts that may occur as a result of master plan implementation could include minor temporary increases in construction vehicle exhaust and some generation of dust during construction. Construction of projects proposed in the Master Plan will take place over several years, however, so impacts would be widely spread out both in space and time. Air quality impacts from construction vehicles will be mitigated by assuring that these vehicles are in good running condition and are not producing excessive exhaust.

Biological Resources/Ecology

The park is located on and close to the Helderbergs and the Helderberg Escarpment. Thacher SP is listed as an Important Bird Area by the National Audubon Society and a Bird Conservation Area by OPRHP for reasons listed in Chapter 1. The importance of the natural resources within the parks is recognized by these designations, the placement of recreation facilities and by the expansion of the BCA designation to the entire park.

Ecological Communities

Twenty-one distinct ecological community types have been mapped within the 2,154-acre park (NYNHP 2012 draft) with roughly 80% percent natural vegetation and 20% in culturally derived communities that include areas that are developed, mowed, quarried, or cultivated. The natural landscape is dominated by hemlock-northern hardwood forest with smaller patches of maple-basswood rich mesic forest, successional northern hardwoods, two types of wetlands, successional old field, shrublands, and the calcareous cliff community.

Master Plan implementation will result in impacts to some of the natural communities in the park (Table 6). Two statewide significant communities will be impacted. These impacts will be mitigated by providing on-site design implementation to reduce vegetation loss.

The addition of rock climbing at the park has been carefully assessed in order to mitigate impacts to the calcareous cliff community and the Smooth cliff brake vegetation existing there. The major mitigation measure will be to require careful routing of climbing routes to avoid areas where this plant is present. The climbing management plan will contain specific language specifying this requirement.

Access routes to the climbing base, as well as the new Tory Cave Trail are necessarily contained within the Calcareous Cliff community. Although the number of acres impacted is small, the community itself is small in area but very significant. Mitigation will be provided by careful assessment of the trail routes, on site, before any construction begins. Construction will be monitored to avoid any rare plants and erosion controls will be in place. The designation of the Calcareous cliff community as a Natural Heritage Area will provide further recognition of the importance of this ecological complex.

Flora

The construction of new facilities will result in some vegetation removal depending on the type and location of the facility. For buildings and other major built facilities the vegetation lost will primarily be in the building footprint and its associated outdoor spaces which are already in a lawn or developed area.

Some opening of vistas along the Escarpment Trail and at Glen Doone picnic area will result in some minor loss of vegetation at the edge of the escarpment. However, this vegetation is in developed areas and much of it consists of invasive buckthorn shrubs. Its removal will have a positive impact on scenic vistas. Although some smaller tree and shrub removal and trimming of limbs may occur, no large or mature trees will be removed.

For trails, the impacts will be mitigated where new trail segments are built by requiring on site selection of the most appropriate route through the area, trimming some vegetation and installing signs or blazes to mark the trail but minimizing removal of existing vegetation.

Table 7 New Acreage of Development in Ecological Communities*

Ecological Community	New Developed Acres
Calcareous Cliff Community	.13
Conifer Plantation	.1
Developed/Mowed Lawn	.57
Hemlock-Northern Hardwood Forest	.82
Maple-Basswood Rich Mesic Forest	.18
Maple-Basswood Rich Mesic Forest (mature)	.03
Shrub Swamp	< .01
Successional Northern Hardwoods	.06
Successional Shrubland	.08
Successional Old Field	.2
Total	2.18

*Bold indicates state significant ecological community

Fauna

There will only be minimal negative impact to the fauna in the park due to the small amount of physical change that is being proposed. Some positive impacts may occur due to the expansion of the designated BCA, the re-routing of trails away from the Onondaga Escarpment, away from wetlands and the possibility of providing tunnels for amphibians and small mammals to cross Route 157. (the last element would be with the cooperation of DOT)

Invasive Species

Trail uses, boating and camping can facilitate the spread of invasive species. Invasive plant seed can be inadvertently introduced on construction equipment and through the use of mulch, imported soil, gravel, and sod. Firewood also poses a risk of introduction of invasive forest pests when it is transported from its location of origin to new locations. Firewood is often manufactured from trees that have died or are weakened or damaged. Their demise or weakened state may have been brought about by invasive insects or diseases, even though the exact pests have not been found or identified.

Implementation of an invasive species management plan at the park will focus on prevention, identification of invasives, early detection, rapid response, and eradication from sensitive habitat areas.

It is important to implement Best Management Practices to minimize the spread of invasive species. Practices such as proper material disposal and equipment cleaning methods limit the potential of invasives to establish in new locations within and beyond a site. DOT has developed useful BMPs for invasive plant control (DOT 2009) that can be tailored to Agency or park-specific projects and operations. These methods will be implemented at the parks during construction.

Forest pests are an important invasive species threat in the parks. The Emerald Ash Borer, Asian Long-horned beetle and the Hemlock Woolley Adelgid have the potential to result in major damage to the forests if they are introduced into the park. Precautions such as surveying and monitoring for such species should be included as part of the invasive species strategy. Since camping is a long standing recreation element in the parks, enforcement of firewood regulations and continuing to provide park sourced firewood to campers is critical. Educational information should be provided, including brochures, posters, bookmarks and other materials as available, for campers.

New construction projects as well as day-to-day operations have the potential for spreading invasives. Park and regional environmental staff are very knowledgeable regarding the impacts of invasive species. Ongoing interpretive programs and training will improve their ability to prevent the spread of invasives. In addition, all equipment, soils, straw and other construction materials used in the parks should be inspected to assure it is not transporting invasive species.

Incorporating the principles of Ecosystem-Based Management is the best approach to invasives species management. This includes consideration of an entire ecosystem and connections beyond the borders of the parks, including trail connections such as the one with the Long Path. OPRHP's invasive species program is based on the best available science, utilizing research on impacts of species and control methods. OPRHP will work closely with stakeholders and volunteers, to monitor the extent and spread of invasive plants in the parks, especially along the roads and trails, and to identify and implement appropriate control measures where needed.

Historic Resources

The Master Plan will have no adverse impacts on historic resources either listed on or determined eligible for listing on the National Register of Historic Places. Educational materials including exhibits at the visitor center and interpretive signage will be developed to interpret the historic resources in the park. (Adams 2013)

Archaeological Resources

The park contains several areas of archeological sensitivity. Any projects involving ground disturbance should be reviewed by the State Historic Preservation Office (SHPO) to ascertain if any of the development proposals in the Master Plan are near areas of archeological sensitivity. If so the recommendations of the SHPO should be followed before construction begins.

Scenic Resources

Implementation of the Master Plan will not result in any significant adverse impacts on scenic resources in the park. Some areas of potential scenic value will be cleared in order to take advantage of an underutilized resource.

Similarly, projects proposed in the park will not have any significant effect on the view of the park from off site.

Recreation

Implementation of the Master Plan will result in substantial beneficial impacts to recreation. The plan provides for a wide variety of new and improved recreation facilities and visitor amenities including a new park visitor center with museum, an expanded camping area at Thompson's Lake, rock climbing, adventure courses, new trail opportunities and others. The trails planning process has resulted in a comprehensive assessment of the existing trails at the park as well as a chance for evaluation of new trail uses and routes. This will result in a better organized trails

system which will accommodate a variety of uses. Master plan implementation will also result in improved trail maintenance including drainage and an improved trail signage system.

Designation of the calcareous cliff community on the Helderberg Escarpment as a Natural Heritage Area will not result in adverse impacts to current recreation opportunities provided at the park. The area proposed as a Natural Heritage Area was carefully selected to accommodate recreational and operational needs while assuring the long term protection of the unique ecological community it represents.

Open Space

There will be no adverse impacts to open space resources resulting from the implementation of the master plan. If acquisition recommendations are implemented the impact will be positive in adding acreage of open space in an area of increasing development pressure.

Transportation, Access and Traffic

Minor increases in traffic will occur due to the increased number of campsites. Access and transportation resources will not be impacted.

Public Health and Safety

Public health and safety are important elements in park operations. New or substantially rehabilitated facilities will be designed and constructed to meet all applicable health and safety codes including compliance with the Americans with Disabilities Act. Design and rehabilitation of infrastructure systems such as electric, water, and sewer where needed will ensure public health protection.

The health and safety aspects of allowing rock climbing and caving will be addressed in the management plans and permit systems for those activities.

Energy, Noise and Odor

Sustainability principles and energy efficiency will be incorporated into the design of all new park buildings, especially the new park visitor center. Master plan implementation may result in some minor temporary increases in noise during construction.

Unavoidable Adverse Impacts

The proposed Master Plan will result in some unavoidable adverse impacts. There will be some minimal permanent loss of pervious soil surface and vegetative cover as a result of construction of the new visitor center, additional camping area, trails and other proposed new facilities. This will be monitored by park staff and action will be taken, if necessary, to prevent any significant impacts from occurring.

In addition to the impacts outlined above, there will also be temporary adverse air and noise impacts (e.g. fugitive dust, noise from construction equipment and vehicles, etc.) associated with construction of proposed improvements.

Irreversible and Irrecoverable Commitments of Resources

The planning, development and implementation of this Master Plan including construction of a new visitor center, expanded camping area and other new proposed facilities, infrastructure and trails will involve the irreversible and irretrievable commitment of public resources in the form

of time, labor and materials. It will also require a commitment to the long-term operation and maintenance costs of the park.

Growth Inducement

Implementation of the master plan will result in some increased recreational use of the parks. This increased recreational use will be carefully managed in an effort to support the vision and goals established to maintain the quality of the parks' important natural, scenic and historic resources. There will be positive, on-going, economic impacts to the communities surrounding the parks in the form of business to gas stations, restaurants and convenience stores. Tourism related expenditures for activities such as camping and day-use can be an element in the economic vitality of localities. Additional camping, new recreation activities, significant natural resources and the parks' location near state and county roadways, help to make this a reality.

Supplemental Environmental Review

Portions of this Environmental Impact Statement are somewhat general or conceptual. Decisions regarding the type and extent of certain actions will be dependent on the findings from site specific studies or analysis in the field. For example, the specific site designs for the visitor center and new campground loops will require more detailed site analysis. The findings from these site specific evaluations may identify impacts that were not adequately addressed in this EIS. Under such a circumstance, an additional or supplemental environmental review will be required. As part of the Agency's responsibility under the State Environmental Quality Review Act, OPRHP will review proposed implementation projects with respect to consistency with this EIS. Projects found by OPRHP to be consistent with the EIS can go forward without any additional review. Other types of proposals, such as the to-be-written cave management plan, may require additional review.

To assist in this consistency evaluation, the following types of actions have been identified in 6 NYCRR Part 617 as likely to require additional review under SEQRA:

- Any new actions not addressed within this EIS that do not meet the Type II categories identified in Part 617;
- Any change from the preferred alternatives for natural resource protection, recreational and facility development (including trails) or other elements of the plan which would result in significant environmental impacts;
- Any leases, easements, memoranda of understanding, or other agreements between OPRHP and private entities or other agencies (such as a concession agreement for an adventure course) that affect resources in a manner that is not sufficiently addressed in this plan.

Chapter 5 - Comments and Responses

Introduction

This chapter contains the responses to the comments received by OPRHP on the Draft Master Plan and Draft Environmental Impact Statement (DEIS) for John Boyd Thacher State Park. The Draft Master Plan/DEIS was issued on July 17, 2013. A Public Hearing was held in New Scotland, New York at the New Scotland Town Hall on August 1, 2013. The comment period ended August 23, 2013.

Out of approximately 80 attendees 17 people spoke during the Public Hearing. Their comments were recorded. During the comment period for the Draft Master Plan/DEIS, the Agency received 23 written comments by letter and email. A list of persons providing comments is included at the end of this chapter.

OPRHP appreciates the time and effort that persons interested in the future of John Boyd Thacher State Park have invested in their review and comments on the Draft Master Plan/DEIS and their participation in the public hearing.

The types of comments received included document editing suggestions, requests for clarification of information presented in the document, and comments related to specific aspects of the plan. All comments were reviewed and organized by categories.

Responses to these comments are found in this section and were considered in revisions found in this Final Master Plan/Final Environmental Impact Statement (FEIS).

Significant Changes to the Draft Master Plan and DEIS in the Final Master Plan and FEIS

- Description of current hunting and fishing regulations in the Park was added to the Existing Conditions section on page 27 in the FEIS.
- Description of Geology in Existing Conditions was revised to include information on rock fracturing, page 19 in the FEIS
- Changes were made to the background and Alternative iii Considerations of the Rock Climbing analysis on pages 43-45 in the FEIS
- The Cave Management Action Step has been moved to the Recreation Development section of the Final Master Plan, Action Step 8 on page 18 of the Final Master Plan.
- The mountain bike skills park and looped trails have been moved from the area south of Beaver Dam Road to the area near the Carrick Road trailhead. Pages 54-55 in the FEIS and page 18 in the Final Master Plan

Responses to Comments

The following section contains a detailed list of comments received from the public during the comment period and public hearings and the responses. The comments are organized by category. Following each category heading there are summarized comments. Following each summarized comment is the Agency's response.

Caves

Comment: Bat Protection

The current version of the proposed Plan includes allowing the Northeastern Cave Conservancy to locate and map caves on Park property and also contemplates guided tours (p. 25).

The commenter stated that these proposals are very risky because it is not known whether humans are a vector for the fungus that causes white nose syndrome (WNS), which has killed an estimated five to six million bats and counting. Until human involvement in the spread of WNS from cave to cave is disproven, to allow anyone, except those assigned a specific research task approved by appropriate State and Federal agencies and with strict protective protocols, to enter caves on Park property creates an unacceptable risk to the remaining bat population.

Response:

The current scientific consensus is that humans are likely vectors for the fungus *Geomyces destructans*, which causes WNS. The US Fish and Wildlife Service (FWS) has developed the document, *National Plan for Assisting States, Federal Agencies, and Tribes in Management of White-Nose Syndrome in Bats*. This document outlines recommended steps that can be taken to reduce the spread of WNS. Chief among these strategies are managing cave access, enforcing equipment decontamination protocols, and educating the public about WNS and the potential for caving activities to spread the disease. OPRHP feels that this plan meets all three of these recommendations.

Installing the bat gate obviously gives the park a level of access control that has never existed at Hailes Cave. With this gate, access to Hailes Cave could be completely restricted; however, the public has requested access to the caves at the park and OPRHP would like to accommodate those requests, if possible. Both the FWS and the DEC feel that adhering to the proper equipment decontamination protocols and restricting access to the cave to those times of the year when bats are not present are sufficient for the protection of the local bat populations. The gate will limit access to the cave to those appropriate timeframes and, although not yet developed, a key element of a future cave access permit will be the requirement that all cavers, whether recreational or scientific, follow the FWS protocols for proper decontamination. This permit system will also be a major element of outreach programs to educate the public about WNS.

Furthermore, caves with completely restricted access are often subject to attempted break-ins and vandalism by those wishing to enter the cave. Where appropriate, regulated access to caves is seen as a successful measure against such activities and results in better management and less impact overall.

Comment – Bat Protection

The commenter expressed agreement with the winter closure of Hailes Cave and other caves usable by bats as hibernacula from October 1 to May 15 or such dates designated by NYSDEC's Endangered Species unit.

Response

Thank you for your comment.

Comment – Cave Management Plan

The opinion was expressed that a cave management plan can be developed before a cave is entirely mapped. The commenter gave an example of a non-profit group that requires that a management plan be approved by the Board before a cave is acquired, and has done this with recent acquisitions. Further expressed the opinion that management plans are intended to be living documents that are updated and changed as more is learned about the resources.

Response

OPRHP wishes to work with the Northeastern Cave Conservancy, Inc. to develop a Cave Management Plan. Determining the details and timing of plan development as well as the details and timing of the eventual cave access permitting system would be a part of this process.

Comment – Implementation Timeline

There is no mention of cave access under Recreation Development in the timeline. A bat gate at Hailes Cave and opening Helmes Crevice are both mentioned but caves and cave access are not.

Response

Implementation of cave access will be contingent upon the development of a Cave Management Plan and a Memorandum of Understanding with a non-profit organization whose mission is preservation of and education about caves.

Comment – Guided Tours

What is meant by “guided cave exploration” or a “guided tour?” Who would lead such a trip?

The commenter expressed the opinion that objective criteria can be developed to permit caving groups to access Hailes Cave without the need for a guide. If Hailes Cave was not in Thacher Park, it would be considered a beginners cave.

Response

Thank you for the suggestion. Specific recommendations like this are exactly the type of issues OPRHP would like to see addressed in the future Cave Management Plan as the best ways to allow patrons to safely access the Park’s underground resources are explored.

Facility and Recreational Development

Comment – Adding Camping

One cannot go very far north of the existing camping loops at Thompson’s Lake without getting on to the Onondaga limestone. Due to thin soils, solutionally-enlarged joints, and other karst features, it is not wise to locate a large number of campsites on the limestone.

Response

There is ample room on the proposed site to locate the limited number of campsites envisioned in areas which will avoid any bedrock features of concern.

Comment – Rock Climbing

A representative of an outdoor education program expressed support of rock climbing as a proposed recreation development in the Park.

Response

Thank you for your comment.

Comment – Plan Climbing Carefully

A request was made for caution and careful planning in the development of climbing at the Park and how and where the escarpment is used was made.

Response

See response to comment on fracturing, below in the Physical Resources section.

Comment – Ropes Course

There is a concern expressed about proprietary ownership. It is hoped that private ownership rights will not be given to contractors [sic].

Response

The plan calls for two new adventure amenities: a ropes course developed in partnership with a non-profit partner to provide educational experiences and to complement Park programming. Another adventure course would be competitively bid. OPRHP often successfully partners with business enterprises to expand and enhance the Park experience. These activities are governed by contracts approved by the Attorney General and the Office of the State Comptroller. Ownership of parkland always remains with the People of the State of New York.

Comment – Hunting and Fishing

Concern was expressed that hunting and fishing are not mentioned in the master plan.

Response

Hunting and Fishing will continue in the Park under the current regulations.

Comment – Pool

A question was expressed as to whether re-building the Thacher Park Pool be studied, expressing the opinion that a pool would receive more use by the local public than a "challenge course." The recommendation was made that a study should include estimated attendance numbers for both potential projects.

Response

The alternative of developing a new pool complex has been extensively examined and found to be infeasible and unsustainable. The plan targets capital investments that can serve more people, participating in varied active and passive recreational pursuits, all year long, rather than concentrating those investments in one activity, swimming, for a brief period of time. Demographic analyses and research on community and home pool developments indicates declining demand for a new outdoor swimming facility in a challenging environment.

Comment – Pool

The current beach is too small for the amount of campers plus the new camping loop and day users in the Park. The pool should be brought back.

Response

The plan calls for a modest expansion of the beach.

Comment – Inflatable Boats

Concern was expressed that the safety of campground residents using “inflatable craft” and launching from the shoreline was not considered. The commenter stated that in years past the County Sheriff had a deputy patrol and this type of practice would be intercepted and curtailed unless all safety rules were observed and observed that the rental boats do not seem to have any oversight. It is frightening to see six people in a small rowboat in the middle of the lake without lifejackets and swimming out of the boat. For a swimmer to re-board a crowded rowboat is not any easy or safe practice. There is no oversight of the rental boat users and no capacity to assist in an emergency. At the very least if boats are rented then have a person watching out for the users and have an outboard to respond. Is this a DEIS issue? It would seem that the State needs to consider water and boater safety in its plan just as it would need to consider the development of paths for hikers or bikers.

Response

Campground staff and lifeguard staff oversee our rental boat operation. All patrons renting a boat must sign an agreement acknowledging the required safety equipment. The agreement specifically requires that all occupants of any rental boat must wear their personal flotation device. Further, the agreement specifically states that no swimming is allowed from the boat at any time. Several members of the Park staff have taken the NYS Boating Safety class.

Comment – Only Allow Tents and Small Trailers in Campground

Recommended that tents and small trailers should be encouraged; very large RV’s prohibited. Tents and small trailers are most compatible with the surroundings and promote a family and small community atmosphere.

Response

OPRHP seeks to serve a wide range of the camping public. Loop A has several large sites which can accommodate larger vehicles. The proposed new loop will likely have smaller sites which would appeal to tent campers.

Comment – Water Quality Results on the Website

Water purity conditions should be made readily available on a website.

Water quality testing is done weekly to assure swimming will be safe, yet there is no easy way for general lake users, or current and prospective Park users, to get the quantitative results.

Response

OPRHP is currently posting beach closures on its website. In addition, OPRHP is working with NYS Department of Health on a website that would provide information on beach results and would link to the ORPHP website. It is hoped that this will be up and running by the 2014 beach season.

Comment – Zoo

A proposal was submitted for a living museum at the Park featuring native wildlife. These animals serve as ambassadors for their species and each has a story to tell. People are informed

on their natural history and habitat needs and learn about the many threats facing wildlife. The thrill to the public seeing live wildlife up close is undeniable and they go home with a greater appreciation for the animals that share our world, in our own backyards.

Response

This proposal, while compelling in its nature, is not compatible with the vision and goals developed by the Agency for Thacher Park.

Comment – Campground Entrance

A proposal was received to create a seasonal day use entrance for Thompson's Lake State Park adjacent to the Emma Treadwell Thacher Nature Center parking lot (across the road). As Thacher Park no longer has a swimming pool, this action would save precious time and gas getting to the beach for day use patrons by cutting the round trip from the Thacher Park picnic areas by several miles.

Logistically, it's a relatively short distance through a wooded area near the parking lot to get into the Thompson's Lake State Park area.

It would also act as a conduit to integrate the Nature Center with day use patrons of Thacher Park while formally unifying Thompson's Lake State Park campers with the Nature Center.

Currently, the Nature Center seems segregated from both Park areas and adding an entrance would greatly enhance the visitor experience.

Finally, there is the public safety component to this, as it would greatly shorten the response time it takes emergency vehicles to get from one area to the other.

Response

Adding a second entrance into the campground would present a host of operational challenges.

Setting up an additional entrance station adjacent to the Nature Center would require more staff, and additional security risks. Additionally, the existing parking lot near the Nature Center is small and sometimes cannot fully handle the volume of cars it gets now. This is part of the reason OPRHP established a second parking area for the Nature Center; further up Nature Center Way.

The logistics of putting a ticket booth/station at this location would also present problems because the booth would have to be located at a point before a vehicle could enter the lot. It would then be difficult to sort out Nature Center patrons, who are not charged a fee, from day use patrons for Thompson's Lake who would be charged. This might blur the lines between these two patron populations.

OPRHP is improving signage to let all campers and day users know where the Nature Center is and emphasize that it is one of the great amenities of coming to the campground. Similar signage and information will be available at the main part of Thacher Park and at the Visitor Center.

Comment – Dark Skies

Light pollution should be minimized through user education, choice of shielded lighting and other infrastructure, and natural barriers.

Dark skies are a shrinking natural resource. They attract, and are appreciated by, visitors and the surrounding community. The Nature Center has also benefited through its astronomy and other night time programs.

Response

Wherever feasible all newly designed facilities and replacement lighting will incorporate dark sky protocols. Campers will be educated about limiting wattage and shielding private campsite lighting.

Impacts

Comment – Economic Impact

As noted the campground is wholly within the Town of Knox and the Lake is within both the Town of Knox and Berne. The economic impact on the Towns needs to be addressed.

Response

Economic impact to the towns is discussed in Chapter 4 of the EIS - Environmental Impact - Growth Inducement.

Comment – Impact of Campgrounds

Both Berne and Knox have less than 3,000 residents. The population of the camp grounds adds over 600 residents and several hundred vehicles. If a developer were to propose a seasonal facility for over 600 occupants at 200 plus campsites or cabins the required DEIS would be more extensive. New York State should follow its own guidelines. The infrastructure design for this expansion needs to reflect the air quality impact just as a traffic study would reflect. If a property owner proximate to the lake proposed a development of 10 to 20 new homes the respective town would enforce the SEQR regulations and cause a very protracted review process that would be onerous.

Response

The impacts and mitigations from the development of all phases of the master plan recommendations are examined and described in Chapter 4 of the Environmental Impact Statement.

Comment – Convenience Store

The Town of Knox could use the tax receipts from a convenience store/gas station within the campgrounds. A facility available to local residents would be a significant gas savings and would improve air quality. It seems ironic that one has to use a gallon of gas just to get a tank of gas.

Response

OPRHP hires concessionaires that are designed to serve the needs of Park patrons. Private enterprise must be called on outside the Park to provide more variety to answer the needs of town residents and others.

Impacts – Air Quality

Comment – Campfires

A comment on air quality is the impact of 150+ campfires. Just go out to the middle of the lake on a Saturday evening at dusk. The prevailing breeze is west to east. The smoke is thicker than a third alarm fire in the South Bronx. What is the resolution for this in the Statement?

Response

Impacts to air quality from the campground are covered in the EIS, chapter 4, Air.

Impacts – Beach

Comment – Impact of Beach Expansion

Private landowners would be fined if they dumped sand or gravel into the lake due to the State saying they would be destroying environment and messing with wetlands. So what impact is this going to have if there is dumping of tens of thousands of pounds of sand into a soft bottom lake? It will sink down into the mud.

Response

The expansion of the beach proposed in the Master Plan is a landward expansion away from the current sand beach at the water's edge into an area demonstrated not to be wetlands. However, being in close proximity to wetlands, OPRHP will consult with the DEC and obtain any necessary permits before commencing with the project.

Comment – Beach Sand and Runoff

Manage runoff in all Park areas; more needs to be said about reducing erosion through regular review and improvement of existing measures including vegetative buffers and maximum diversion of runoff, particularly at the campsite. At the campsite, beach sand has been added for decades to replace what has migrated beyond the beach to fill in the lake due to runoff after rainfall, wave action, and the large [up to ten feet], seasonal rise and fall of the Lake level. Land-based measures to minimize loss of sand from the beach area and provisions for reclaiming migrated sand need to be part of the Plan.

Response

As resources allow, the park takes measures to reduce erosion, particularly where environmental impacts are occurring. A vegetative buffer already exists between the campground and the beach, but any future work in that area will include provisions to retain or create green infrastructure stormwater controls, including practices such as retaining natural buffers, constructing rain gardens and bio-swales, and the replacement of impervious surfaces with porous ones where and when feasible.

Due to a variety of factors, the park has added sand in order to maintain the beach over the years. Although we don't know exactly where the sand has migrated to and what impacts it may have had, the Agency will look into what could possibly be done to reclaim lost sand and what additional steps might be able to be taken to minimize the amount of sand lost in the future. The Agency has begun coordinating with our own Water Quality Unit, and will work closely with DEC, and other involved agencies to determine possible solutions to this issue.

Comment – Beach Maintenance

Over the years, sand has been added to the beach to replace what has been lost due to wave action and a common, seasonal water level fluctuation of +/- ten feet. Erosion has added to this migration of sand to the lake bed, an unnatural process.

Standards should be set for managing beach sand, to recover quantities that have already washed onto the lake bed, control runoff, and otherwise minimize the amount of new sand added and filling-in of the lake.

In the response, please state the NYS requirements for property owners interested in beach development.

Response

In the last 12 years, approximately 450 – 500 cubic yards of sand have been added to replenish sand washed into the lake. The single largest amount added was 325 cubic yards after the lake level reached an unprecedented high level following hurricane Irene and tropical storm Lee. As is pointed out in the previous response, OPRHP is looking into ways to reduce the need for beach sand replacement.

The requirements for private property owners interested in beach development are beyond the scope of this master plan.

Invasive Species

Comment – Impact of New Campgrounds on Zebra Mussels, Warnings and Education

The opinion was expressed that zebra mussels were in all likelihood brought in by people in the campgrounds. So if the numbers of campers are increased what is OPRHP going to do to patrol the campers' boats and use the limits placed on the boat launch at the south end of the lake?

Site users and Park personnel should also be educated about precautions to take regarding the zebra mussel infestation of the lake.

Response

OPRHP is committed to protecting park lands from the impacts of invasive species. Part of that commitment is informing patrons as to their potential role in the spread of invasive species and of the negative impacts of invasive species. Interpretive signs addressing steps patrons should take to avoid spreading aquatic invasive species have been installed at the nature center boat launch. OPRHP coordinates with DEC in efforts to educate boaters who use the DEC launch at the southern end of the lake.

OPRHP will also develop signage to warn lake users and Park staff about the potential for injuries from zebra mussel shells and the potential for spreading these organisms to other water bodies.

Comment – Environmental Education for Invasive Species

Detection and control measures should be applied to invasive species beyond zebra mussels, through education and other actions.

The Nature Center has done good work with the Friends and community volunteers. Campsite users and staff should be reminded of the ability of insects and seeds to travel home on their clothing or in their possessions.

Response

OPRHP understands the importance of education as a key element in the control of invasive species, including aquatic invasives. Invasive Species Management Plans such as the one that will be developed for Thacher State Park include this education element.

Comment – Invasive Species

Invasive species issues need to be dealt with at the lake.

Response

The aquatic invasive species currently in Thompson’s Lake include Eurasian water milfoil, curly-leaved pondweed and zebra mussels. OPRHP owns only a small portion of the lake shore but will work with the Lake Association and DEC to determine the best course of action for control of these species in the lake.

Comment – Aquatic Weeds – Use of Herbicides

Aquatic growth is an issue. Areas of the lake experience dense weed growth. There has never been a comprehensive approach to weed management. Observations have indicated that the State campground beach area has added herbicides to the lake to keep the State beach area clear. This needs to be noted in the DEIS. Has it been a past practice and is it ongoing? There should be no chemical based aquatic weed control measures

Response

OPRHP has never used any herbicides to control aquatic weeds in Thompson’s Lake and there are no plans for herbicide use in the future. OPRHP will work with the Lake Association and DEC on a plan for control of the aquatic invasives in the lake.

Comment – Zebra Mussels - Control

How can the largest property owner on the lake ignore the impact of invasive species, especially Zebra mussels? There are several chemical trials underway.

Response

At this time there is no practical control method for zebra mussels. OPRHP will continue to follow the ongoing research on control measures and will take appropriate actions in cooperation with DEC and the Lake Association when they are available.

Comment – Signage at South Boat Launch

The signage regarding zebra mussels at the south boat launch is non-specific and does not mention the mussels at all. OPRHP should work closely with DEC to improve the signage there.

Response

OPRHP will work closely with DEC to make sure the signage at the South boat launch, operated by DEC, includes more specific information on zebra mussels and the other aquatic invasive species found in the lake.

Natural Resource Protection

Comment – Wildlife Crossings

Wildlife crossings are mentioned in Facilities and Operations Action Step 9 but there should be greater emphasis on the importance of wildlife crossings in the master plan due to the significant bio-diversity of the Parks, including a species of special concern salamander, the Jefferson salamander. There should be a separate action item added under the Natural Resource Protection Strategies section to address the importance of wildlife crossings to reduce wildlife mortality on all Park roads. It should state that wildlife crossings will be considered whenever any new road or culvert work is being contemplated, or whenever else feasible. Wildlife crossings should be sized appropriately so that medium sized animals can access them in addition to smaller mammals, reptiles and amphibians. This is also a public safety issue as drivers will sometimes swerve to avoid wildlife in the road which could cause a traffic accident.

Response

OPRHP agrees that wildlife crossings, particularly along Rt. 157, are very important. This is a State Route and changes that might mitigate the impacts of vehicular traffic on wildlife, and vice versa, can be suggested to NYS DOT. OPRHP has stated that it is interested in cooperating with NYS DOT on possible improvements to State Route 157. In regards to other park roads that are directly under OPRHP control, wildlife will certainly be included as a factor during any reconstruction or repair work. Wildlife crossings will be sized appropriately so that medium sized animals can access them in addition to smaller mammals, reptiles and amphibians.

Comment – Control Resident Geese

Resident geese should be controlled. Resident geese pollute the water, beachfront and surrounding properties. A plan for controlling them, within State and Federal guidelines, is important.

Response

OPRHP agrees that resident Canada Geese need to be managed to control their impacts to our recreational facilities. OPRHP is developing statewide guidelines to assist Park staff in addressing Canada Goose impacts. Park staff currently chase geese away from the beach area during the day and use lasers to prevent them from roosting in the swimming area at night. Should additional measures be necessary, Park staff will follow the statewide guidelines to reduce the impacts of resident Canada Geese.

Un-categorized Comments

Comment – Information and Communication

Web-based passive communication should be enhanced to inform the general local community, town governments, and local special interest groups about planned construction, alterations and policy changes.

Relationships with neighbors of all types would be enhanced by a weblog and mailing list to which interested parties could add themselves.

Response

This excellent idea would need to be implemented state-wide. Resources are not available at this time to implement such a communications network. Currently this type of information is often disseminated by friends groups and Park social media web pages.

Comment – External Influences

It is nice to know that the EIS talks about protecting the impacts from the master plan. Protection from other external influences should also be discussed.

Response

OPRHP strives to maintain open lines of communication with local governments to help support community development while limiting negative impacts on Park land. Friends Groups and private organizations like Parks & Trails New York and the Alliance for New York State Parks have missions to preserve State Parks.

Comment – Eminent Domain

Is there going to be eminent domain to get land for the planned new areas?

Response

All aspects of the master plan occur on lands currently under OPRHP jurisdiction. Any potential additions to the Park will be pursued from willing sellers and in accordance with the State's Open Space Conservation Plan.

Physical Resources

Comment – Geology

The master plan talks about the juncture of the Appalachian Plateau, the Interior Lowlands, and the Hudson Valley. This mixes apples and oranges. The first two are names of physiographic provinces. The last is a geographic name. Either change the "Hudson Valley" to the "Great Valley," which runs from the Champlain Valley all the way to Tennessee, or change the first two to the Helderberg Plateau and the Mohawk Valley.

Response

The plan uses the names commonly associated by the public with the features in question. Nevertheless, the suggested changes have been made in the master plan and the EIS.

Comment – Horseshoe Falls

A request was made that consideration be given to restoring Horseshoe Falls. At some time in the past, water was diverted from the waterfall by manmade trenches. This has developed into a hazardous area that is worsening. This water should be diverted back to its natural course over the waterfall. Horseshoe Falls was a great contributor to the Cave Gulf formation and should be restored to its grandeur.

Response

OPRHP staff met with the commenter at this location on 8/15, to get a better understanding of the site drainage issues. It is agreed that at some time in the past, the ephemeral stream course

that was the source for Horseshoe Falls was re-routed into a fissure. OPRHP is committed to further study this issue and address any safety concerns.

OPRHP will have to do more research to determine if re-establishing this flow through what is presumed to be its prior course is feasible and/or warrants the resources and costs that would be required.

Comment – Small Pond

The small pond mentioned in the northern section of Thacher is artificial. The west end of the pond is an earthen dam.

Response

Thank you for this information it has been added to the description of the pond.

Comment – Streams

Most of the major streams in Thacher run from south to north. The one exception, ironically, is Outlet Brook, so named because it is the surface outlet of Thompson’s Lake.

Response

This stream is not in the Park.

Comment – Take Fracturing Into Account

Concern was expressed about how the geology of the escarpment is portrayed in the DEIS, specifically the fractured nature of some of the layers exposed at the escarpment. Additionally the commenter called into question the advisability of planning rock climbing and placing significant structures, such as the proposed Visitor Center, close to the edge of the escarpment. The commenter states that these comments stem from scientific concerns about the suitability of the rocks for climbing. The commenter suggests that an independent study of the rocks by a neutral party is advised to mitigate issues in the future.

Response

Thank you for your detailed comments and edits regarding the condition of the rock that makes up the escarpment as well as the proper terminology for describing those features. This information has been added to the EIS.

OPRHP agrees that the escarpment contains multiple fractures and karst features. The materials provided by the commenter suggest that significant failures, while clearly possible, occur very infrequently. The possibility of significant rock falls, the frequency of which happen on the scale of centuries, should not prevent access to this prominent Park resource.

Furthermore, the suggestion that potential rock falls make the area unsafe for recreational rock climbing implies that it would be unsafe for any kind of activity within the fractured area of the escarpment, which, according to the comments provided, range as much as 50+ feet away from the cliff edge. This would preclude the public use of the Overlook and the Indian Ladder Trail as well as much of the Glen Doone, Lagrange Bush, Minelot, Indian Ladder, Horseshoe I and II, and Hailes Cave picnic areas. The Agency has accepted this risk and allowed patrons to picnic and walk along the top of the escarpment and hike along the Indian Ladder Trail at the base of the escarpment for almost 100 years. It is the Agency’s position that these activities should continue at the Park.

In terms of rock climbing specifically, the correspondence from geologists/climbers that were consulted as evidence that rock climbing at Thacher should be deemed inappropriate actually seemed to support the Agency's position that climbing at Thacher poses no discernibly greater risk than climbing at many other routinely climbed cliffs around the world. They point out that the rock of the escarpment is obviously softer and more fractured than some climbing areas, but it is also harder and less fractured than others. With appropriate management of how and where climbing is permitted, the inclusion of this fast growing sport would be an asset to the Park.

The desire of patrons to access restricted areas of the escarpment at Thacher Park is very clear. A regulated climbing program would come with signage and information about basic safety protocols, approved climbing routes, and proper etiquette. Allowing recreational climbing would also increase the use of the escarpment by responsible patrons whose presence would likely be a deterrent to those wishing to ignore Park rules and regulations. The Agency feels that the institution of a permitted, regulated, recreational climbing program would be an overall benefit to attempts to make the escarpment cliffs as safe as possible for all Park patrons.

Numerous federal, state, and local agencies allow rock climbing under various management regimes. The master plan calls for the Agency to work with local and national climbing organizations and climbing experts to develop a management plan that will protect the sensitive natural resources of the escarpment while allowing rock climbing in as safe a way as possible without denying our patrons access to a popular and growing sport. Given this analysis, the Agency will seek to advance a planning process to develop a rock climbing program at Thacher Park that can be safely accomplished.

With regard to the development of a new Visitor Center, OPRHP has retained professional engineering services, including appropriate geotechnical testing and assessments, to guide site planning and development of new structures.

Plan Corrections

Comment – Names

Action Step 8 – Spelling - Change “Northeast Caving Conservancy” to “Northeastern Cave Conservancy, Inc” (NCC)

Response

The name of the organization has been changed throughout the document.

Comment – Move to Recreation

A question was asked as to why Cave Management is not included as an Action Step under Recreation Development rather than under Facilities and Operations? Noting what is included under Recreation Development like challenge courses, rock climbing, mountain biking, and a high ropes adventure course, this seems to make little sense.

Response

The Cave Management section has been moved to the Recreation Development Action Steps as suggested.

Plan, General

Comment – Do Not Change the Character of the Park

Lake homeowners expressed concern that many of the changes in the master plan may dramatically change the character of the tranquil, pristine lake and the Parks. We sincerely hope that these NYS Park gems will not become overly commercialized or overly crowded, and we hope that each addition will be carefully thought out.

Response

OPRHP shares your concerns and this plan attempts to balance the Agency's mission of providing outstanding public recreational opportunities while preserving the natural resources of the Park.

Comment – Staffing

No mention is made in the plan for extra staffing needed at the nature center or to repair damages to the trails such as when switchbacks are ignored and bicycles go straight down the slope or for ATV use.

Response

The master plan offers a blue print for the development and management of the Park going forward, but is dependent on factors beyond the Park's control for staffing, operating and capital allocations. Master plan recommendations will be implemented as budgets and staffing allow.

Comment – Give This Park the Attention it Deserves

The opinion was expressed that Thacher Park should be given the attention that is deserving of a State Park with such close proximity to the capital city of Albany. The capital region continues to grow and Thacher Park is only twenty minutes from the city line. Many have often felt that Thacher Park deserves more resources. Thacher Park should be to Albany what Saratoga Spa is to Saratoga Springs. OPRHP should lift up Thacher Park's place in society and make the Park a place we are proud of and can boast about. Thacher Park should meet the standards of the highest praise. New York State's Capital and the politicians who work there would do well to recognize the asset Thacher Park is to this area. Build on this asset and receive the praise of all who live here. A public park like Thacher reflects on our government and how successful it is.

Response

This master plan is predicated on this idea. The overarching goal of the plan is to improve the Park for four-season recreation and enjoyment, and enhance the Park's appeal as a special destination. Investments spurred by this plan, including the development of a new Visitor Center/Park Office/Event Space building, as well as comfort station replacements, trail developments, and upgrades to historic picnic areas, create a turning point for the Park and herald a significant new period of improvements, timed to celebrate the Park's 100th anniversary in 2014.

Thompson's Lake

Comment – Maintenance of Pump Station

Long term maintenance plans for the pump station at the southeast area of the Lake should include noise, light and erosion controls and screening. Any pump station lines traversing the lake bed should be monitored.

Response

There are no longer any active waterlines traversing Thompson's Lake. OPRHP will look to address any screening or related issues.

Comment – Boat Launch

Excessive boat speed and illegal launchings at the lake need to be addressed much more effectively than they have been in the past.

Response

The boat launch is not under the jurisdiction of OPRHP.

Comment – Water Resources

The discussion of Thompson's Lake seems to be taken directly from Goldring's Geology of the Berne Quadrangle. Thompson's Lake is described as being in a sinkhole. While Winifred Goldring interpreted the lake in this manner, it is not true. Most of Thompson's Lake is surrounded by and underlain by the Esopus shale and the Schoharie sandstone. (Sinkholes don't form in shales or sandstones.) There is Onondaga limestone at the south end of the lake and there is an underwater outlet through the limestone, but even here the amount of limestone is questionable. At the southeast corner of the lake near the surface outlet (yes, there is one), the limestone extends probably no more than 3 to 4 feet below the water level.

Response

Thank you for this information. References to Thompson's Lake being in a sinkhole have been removed.

Comment – Water Supply and Sewage

Water supply and water use needs to be addressed. For years there were no showers available to campground residents. The waste from the bathrooms needs to be thoroughly addressed. Is all waste plumbed to an off-site treatment facility? All the water supply of the campgrounds is pumped from the lake. The state seems to consider Thompson's Lake to be an unlimited supply. This plan adds several hundred more daily showers and flushes of toilets. What will be the lake shoreline mark predicted for August 1 of any year as a result of the increased pumping/use by the campgrounds?

Response

The campground at Thompson's Lake no longer uses the lake as a water supply. The campground has been using groundwater from drilled wells since 2008. Wastewater is currently pumped to the sewage treatment plant at Thacher.

Comment – Thompson’s Lake Stocking

The opinion was expressed that the State seems to be only interested in stocking trout and not pan fish. This year there have not been have not been catching yellow perch or bullheads. Sunfish seem prevalent but very small. The trout stock is nice but they seem to attract a very limited number of fishermen with boats and gear for deep access to the cold water species. Before the trout were entered into the lake there was an abundance of walleye. There hasn’t been one walleye caught since the early 1960’s. If the lake is going to continue to be a location for pan fishing then the impact of the number of people increasing the demand on the native pan fish needs to be considered in the Environmental Impact statement. Simple fix; have a fish stocking plan for the varieties that are sought after in the lake, pan fish.

Response

DEC is the agency in charge of stocking Thompson’s Lake. Currently, they are stocking Thompson’s Lake with rainbow trout and brown trout just before Memorial Day. OPRHP has never been contacted by DEC for input.

Comment – Boat Launch

The carry-on-only boat standard should be continued, prominently publicized on the web site and grounds, and strictly enforced. Enforcement should include monitoring of the Route 157 Town of Berne access road at the south end of the Lake and co-operative enforcement efforts with the Sheriff as well as Town and DEC, which have a co-operative agreement to maintain fishing access at the area that includes a 15 HP motor limit.

Response

Carry-on (or car top) boats are the only type of watercraft that may be launched from the OPRHP launch near the beach area. This is enforced by Park personnel. The State Park Police have no jurisdiction at the DEC boat launch at the south end of the lake.

Trails

Comment – Equestrian Use of Trails

Apprehension was expressed about equestrian use of the north section of the Park. On page 10 [of the DEIS], under Recreation Resources/Activities a list of designated activities is given. Horseback riding is conspicuously absent from this list.

Then, under action step 7 [in the Draft Master Plan] it is stated that “Because of damage to existing trails and resources, funding needed to upgrade trails surfacing and lack of local demand, there will be no designated equestrian trails in the Park.”

A request was made to clarify the meaning of this wording in the Master Plan pertaining to equestrian use in the north section of the Park.

Response

Currently equestrian use of trails is not permitted at Thacher Park. There are no trails designated for this use, which is the reason the list of designated trail uses does not include it. The planning team has documented the degradation of trails used by equestrians in the northern part of the Park. The plan does not designate any trails for equestrian use, which is the status quo for this recreational activity.

Comment – Single Track Trails vs. Keeping Old Roads

Strong disagreement was expressed with the recommendation to replace old roadbeds with single-track trails. The commenter stated the opinion that many of these old roads are historical resources that should not be diminished for the sake of what seems trendy today. Just as other historic features provide a link to the past, these old roads knit these historic features into a coherent whole. It is a commentary that the Master Plan does not even mention the name of Sawmill Rd. Rather than hide the old roads under trendily designed trails, OPRHP should save these historic resources.

Response

Many criteria were involved in assessing and analyzing the trail system and identifying the need for reroutes and closures. Due to the alignments of some of the old roadbeds (in flat areas or perpendicular to the side slope), these trails require expensive maintenance, resources and staff time to keep them in suitable condition. In addition, snowmobiling was being removed as a use from some of these trails leaving only non-motorized uses. Sustainably built single-track trails will require very little maintenance and resources compared with the wider road like trails while accommodating the designated non-motorized uses.

Interpretation of historic resources is cited as part of the master plan (see Action Step 5 under Recreation Development and Action Step 2 under Facilities and Operation). Consider working with the Friends Group and Park staff as additional interpretation signage and programs are developed at the Park.

Comment – Escarpment Trail

It is recommended to extend the escarpment trail to Yellow Rocks. However, the map that shows the new trail route clearly comes out at Greenhouse, which is where the current “herd path” exists. (There is an old trail heading north from Yellow Rocks, but this is not shown on the map and actually has no easy connection to the Escarpment Trail.)

Response

This has been corrected to read Greenhouse.

Comment – Multi-Use Trails

A stronger statement in the plan regarding multi-use trails should be made. OPHRP should take a more defined leadership or guidance role with respect to how the trails are used and by whom, and that the trails are used in the way they were designed to be used. This is a challenge in all parks.

Response

Determining appropriate uses for trails is dependent on a wide variety of factors. Whether a trail is designed or maintained to be multi-use or single use is considered on a case-by-case basis.

OPRHP makes every effort to engage trail users in planning and stewardship of the trail system.

Comment – Bicycles on Trails

It is odd that bicycles are not allowed on trails in Thompson’s Lake campground. This makes it inconvenient to get around.

Response

Bicycles are allowed on Park roads in the campground. In addition, the plan calls for a multi-use trail connection with the main part of Thacher to access miles of multi-use trails.

Comment – ATV Trail

The opinion was expressed that in developing a Master Plan for the newly created Thacher/Thompson’s Lake Park area, the use of ATV's and a specially designated trail could be beneficial to the Plan. ATVs and their use are a growing sport and the ability to visit the Park and enjoy it's beauty should be considered.

Response

Thank you for your recommendation. ATVs are not permitted anywhere in the State Park system except for emergency vehicles driven by police and fire personnel.

Comment – Accessible Trails

With an aging population have you taken into consideration making the trails available for handicapped people and seniors?

Response

The plan includes improving accessibility along a portion of the Escarpment Trail and developing accessible routes to destination locations in the Park. All trails will be designed according to the latest ADA guidelines for accessibility.

Comment – Cross Country Skiers and Snowshoers

There is a conflict between cross-country skiers and snowshoers so if you designate trails please separate these two activities.

Response

As noted in Appendix A – Trail System Implementation, signage may be installed to educate trail users on proper trail etiquette. For example, informing cross-country skiers to stay to the right and snowshoers to the left. The situation will be monitored and park staff will address as needed.

Comment – Trail Closures are Detrimental to the Trail System

Although the trail system in Thacher Park north was done piecemeal – over some time – as land was purchased and added to the Park, trails were mostly put on old roads to avoid making new ones. What evolved into today’s network of trails are “loops” of various lengths and sizes. If a person was to begin a walk, and end in the same spot there currently exist many options for a “loop walk” short moderate or longer. If connector trails are eliminated, there will be a decreasing number of possible hiking routes and “loops” to choose from. Trail closure is a detriment to the trail system – not an asset.

This could also be a safety issue if all possible public access routes are not available.

Response

With the implementation of the plan, there remain many loop trail options of various lengths from all access points. This was a consideration during analysis of the trail system.

Comment – Reroutes

Two trail sections had to be re-routed in Thacher Park north area in recent years in order to avoid wet areas or ledge rock. New sections were established and old sections were erased using branches, limbs, brush, etc. to block the ends of the closed trail sections. The trail closures were removed by trail users who independently re-opened the trails. In other sections switchbacks were installed but were ignored in favor of straight down the slope trails. Obstructions to the slope were put in place but were removed by trail users. So in proposing trail re-routes how is it expected to keep old trails from being used and abused with all closure attempts ignored?

Response

Additional measures could include: placing branches/logs at intervals along the closed trail section and placement of “Trail Restoration” signage at the reroute end points. Educating trail users about reasons for trail closures may help as well. Appendix A of the FEIS includes a link to *OPRHP’s Guidelines for Closing Trails*. Engaging trail users in the development and maintenance of the trail system by starting a trail advisory group representing the various users or a trail stewards program, as noted in Appendix A, may help alleviate the issue. Park staff will work with volunteers to address the situation as needed.

Comment – ATV Use

ATVs regularly use the trails in Thacher Park north section. There is no enforcement.

Response

ATV use within State Parks by the public is not allowed. Such uses are illegal and violators are subject to enforcement and penalties. Enforcement by Park Police will be increased as funding and other resources are made available.

Comment – Designation of Trails

How is it expected that designation of trails will work when some riders of mountain bikes and snowmobiles ignore the regulations and the law?

Response

Designating and posting trail uses and maintaining all trails in good condition go a long way in guiding appropriate use of trails. Park staff, and in particular Park Police, will conduct the primary enforcement of proper use of trails. However, Park staff relies on trail users to be self-watching and alert Park officials of any concerns.

Comment – Mountain Bikes

Support was expressed for SMBA's involvement in mountain bike use planning at Thacher Park. SMBA was noted for its good stewardship of the land and its understanding of how to build trails that entice beginners to improve and explore while challenging experienced riders.

Response

Thank you for your comment.

Comment – Trail Staffing

Request was made to increase staffing to keep wider track trails open and to enforce designated trail uses.

Response

This recommendation is noted, however, staffing levels are decided on by the Park and the Region and are outside the scope of this master plan.

Persons/Organizations Who Provided Comments

(Listed alphabetically by last name)

Name	Title	Organization
Edie Abrams		
Bob Addis	President	Northeastern Cave Conservancy
Tim Barnard	Albany County Representative	NYS Fish and Wildlife Board
Josh Bochniak	Climbing Programs Coordinator	Cornell Outdoor Education
Kevin Busch	Secretary	Albany County Conservation Alliance
Woodruff Carroll		
Art Ceas		
George Christian	President	Thompson's Lake Improvement Association
Kathleen Conklin		
Eliot Cresswell		
Eileene Newell Cuscione		
Laure-Jeanne Davignon		
Thom Engel		
Robert Francini		
Rick Georgeson		
Deborah Goetz		
Thomas Goetz		
Bill Lyons		
Kelly Martin		
Jim McNaughton		
Marilyn Miles		
Justin Minder		
Christopher Morris		
Karl Parker	Certified Wildlife Biologist	
Michael Reilly		
Michael D. Reilly, Sr.		
John Rozell		
John and Diane Teevan		
Marietta Velvis		
Dr. Charles Ver Straeten	Geologist	

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Appendices

- Appendix A – Trail System Implementation
- Appendix B – Soil Descriptions and Limitations
- Appendix C – Flora and Fauna Lists
- Appendix D – Cultural Resources and Park History
- Appendix E – Bird Conservation Area Management Guidance Summary

Appendix A – Trail System Implementation

Introduction.....	1
Implementation Steps	1

Introduction

The trail system as laid out in the master plan includes over 29 miles of existing and new designated trails that provide a variety of trail experiences for hiking, biking, cross-country skiing, snowshoeing and snowmobiling (See Figures 14 and 15 of the master plan). The trail system includes both hiking only and multi-use singletrack (narrow gauge) trails as well as wider (doubletrack) multi-use trails.

The following implementation steps were developed based on trail assessments of both the trail conditions and the trail system as a whole conducted during the master planning process.

Implementation Steps

Implementation of the trail system modifications will be guided by staff and volunteer knowledge of trails, the trail assessment information collected in 2011-2012 and the *Standards and Guidelines for Trails in NYS Parks*. Implementation of trail projects will follow procedures as laid out in the *Trail Project Approval Process for NYS Parks*. Trail signage will be developed in conjunction with the *Trail Signage Guidelines*. Trail closures will follow appropriate closure techniques as laid out in the *OPRHP Guidelines for Closing Trails*. These technical documents are available at: <http://www.nysparks.state.ny.us/recreation/trails/technical-assistance.aspx>.

In order to provide specific guidance on implementation of this plan for park staff and volunteers, the following table includes a listing of all existing and new trails and specific actions that were identified during the planning process with regard to maintenance, rehabilitation, re-routing or additional construction of each trail. Trails are listed by names as noted on the Existing Trail System (Figure 12). Alternate names may be considered as the park upgrades its trail signage system. Trailhead and trail intersection signage will be installed at appropriate locations throughout the parks, in addition to signage installed along nearby roads indicating trailhead locations.

Table 1: Implementation Steps for Trails at Thacher State Park - North

Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
Blue Trail (BL)	Blue	H, B, SS, XC	0.48	<ul style="list-style-type: none"> • Reroute short western section of trail; close and restore fall line section. • Improve bridge locations to make platform flush with trail.
Fred Schroeder Memorial (FS)	Red	H, B, XC, SS	2.86	<ul style="list-style-type: none"> • Remove widow makers from trail corridor. • Water management and erosion control techniques should be used to reduce wet areas and erosion along this trail. • Realign short steep section where trail connects to west end of W4 with gentler grade (may include benchcutting and switchback development); consider

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Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
				<p>interpretation of the mature instance of the significant ecological community in this area.</p> <ul style="list-style-type: none"> • Realign gullied/rocky section as trail descends to eastern end of W4; improve drainage towards bottom of trail with installation of knicks to shed water off trail.
Hang Glider Road (HG)	Magenta	H, B, SS, XC, SM	0.97	<ul style="list-style-type: none"> • Repair two metal culverts near trail intersection with P Trail. • Water management techniques should be used to reduce wet areas along this trail.
High Point Road (HP)	Brown	H, B, SS, XC, SM	0.97	<ul style="list-style-type: none"> • Water management techniques should be used to reduce wet areas along this trail. • Install blazing at appropriate intervals (insufficient in some areas).
Long Path	Aqua Green	H, B, SS, XC, (SM)	3.26	<ul style="list-style-type: none"> • Remove widow makers from trail corridor. • In section of trail just north of Perimeter Trail, consider realignments slightly up onto side hill for better drainage. • Upgrade southern section of trail as part of Bike Path development (Phase II).
Perimeter (P)	Yellow	H, B, SS, XC, (SM)	2.45	<ul style="list-style-type: none"> • Remove widow makers from trail corridor. • Water management and erosion control techniques should be used to reduce wet areas and erosion along this trail; address washed out areas. • Improve directional signage at Carrick Rd trailhead. • Re-align hill section between Old Stage and Carrick Road trailheads (currently fall line); upgrade trail tread across ditch at bottom of hill (ie. additional stepping stones, bridge structure). • Construct a bridge or boardwalk across southeast wetland area of pond; install wire case protection for pond inlet to avoid clogging and make pond standpipe beaver proof; repair/ replace bench; consider interpretive signage to highlight resources. • Close and restore temporary reroute around pond. • Upgrade southern half of trail as part of Bike Path development (Phase II).
Salisbury (S)	White	H, B, SS, XC	0.69	<ul style="list-style-type: none"> • Water management techniques should be used to reduce wet areas along this trail. • Upgrade trail as part of Bike Path development (Phase II). <p>Note: Snowmobiling is not allowed on this trail easement.</p>
W3	White	H, B, SS,	0.34	<ul style="list-style-type: none"> • Trail is in good condition.

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Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
Connector (W3)		XC, SM		<ul style="list-style-type: none"> Consider combining with W5 and renaming.
W4 Connector (W4)	White	H, B, SS, XC, SM	0.08	<ul style="list-style-type: none"> Remove widow makers from trail corridor. Trail is in good condition. <p>Note: Trail will be shortened due to realignment of the Fred Schroeder Trail in this vicinity; consider renaming as Basswood Trail or other name.</p>
W5 Connector (W5)	White	H, B, SS, XC, SM	0.38	<ul style="list-style-type: none"> Trail is generally in good condition. Water management techniques should be used to reduce wet areas along this trail. Consider combining with W3 and renaming.
Existing W1, W2, and remnant farm roads				<ul style="list-style-type: none"> Discontinue mowing, close and restore these corridors.

Types of Use: H (Hiking), B (Biking), SS (Snowshoeing), XC (Cross-country skiing), SM (Snowmobiling)

*Uses noted in () indicate only a portion of that trail is open to the use.

** Mileage calculations include portions of conceptual trail alignments. Final mileage calculations may differ when trails are developed.

Note: A composting toilet will be installed in the vicinity of the Carrick Road trailhead to provide a year-round restroom facility to accommodate park visitors in the northern section of Thacher State Park.

Table 2: Implementation Steps for Trails at Thacher State Park - South

Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
Blue Trail (BL)	Blue	H, B, SS, XC, (SM)	2.02	<ul style="list-style-type: none"> Remove snowmobile markers from loop portion of trail corridor. Refresh blazing and direction signage as needed. Water management and erosion control techniques, including treadway improvement, should be used to reduce wet areas and erosion along this trail. Improve trail access to and develop a scenic overlook at wetland area on western boundary; consider interpretation at this location. Explore trail connection with adjacent landowners for southern extension of the trail system.
Escarpment (ET)	Pink	H, SS	2.96	<ul style="list-style-type: none"> Upgrade main section of trail (from Glen Doone to the new Visitor Center at the west end of the Indian Ladder Trail) to meet ADA standards. Determine final trail alignment for extension of trail to Green House pavilion (install fencing and signage consistent with existing

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Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
				trail) • Formalize northern trail connection to trail system (bike path) just north of Hailes Cave parking lot. • Open up and maintain additional scenic vistas along this trail as per the master plan. Note: Upgrades to trail corridor will consider use of CCC-era rock work to reflect history of area.
Hailes Cave (HC)	TBD	H	0.04	• Additional plant surveys to be conducted prior to construction. • Design and develop trail and viewing platform.
Indian Ladder (IL)	Aqua Green	H	0.44	• Repair and maintain retaining walls and stairs along trail. • Improve trailhead signage. Note: Trail will continue to be closed to hiking in winter; park management will coordinate guided hiking tours during the winter months based on leader availability and trail conditions; crampons will be required; park may provide rentals. Note: Upgrades to trail corridor will consider use of CCC-era type rock work to reflect history of area.
Long Path	Aqua Green	H, B, SS, XC, (SM)	4.02	• Reblaze new alignment where trail is co-aligned with other trails. • Improve road crossing near existing park office with striping; consider mowing or surfacing where trail crosses open field behind office and install more blazing; consider signage/kiosk in this vicinity to highlight existence of trail. • Water management and erosion control techniques should be used to reduce wet areas and erosion along this trail.
Nature (NT)	Lime Green	H, B, SS, XC	1.23	• Repair bridge abutments. • Reroute and develop singletrack trail section between bridge and existing W4 Trail. • Reblaze W4 as Nature Trail; close and restore upper section of existing Nature Trail. • Reblaze first trail section (currently white) from Paint Mine as part of this trail; first interpretive feature at trailhead. • Consider renaming trail; consider interpretation options including historic, cultural, and natural resource interpretation.
Orange (O)	Orange	H, B, SS,	0.73	• Reroute western section of trail eliminating

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Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
		XC		<p>access to maintenance area and restore sections to be closed.</p> <ul style="list-style-type: none"> • Refresh blazing as needed. • Reestablish outslope along wet sections. • Regrade and reestablish drainage ditch and treadway along eastern ravine section above Hop Field; remove some vegetation along escarpment to enhance scenic value of trail.
Red (R)	Red	H, B, SS, XC	1.14	<ul style="list-style-type: none"> • Determine final alignment of rerouted section to align past Knowles Flats pavilion; develop as singletrack trail. • Close and restore original alignment. • Blaze W3 reroute trail as part of Red Trail (see W3 below for more details).
ST (TBD)	TBD	H, B, SS, XC, SM	0.76	<ul style="list-style-type: none"> • Explore trail connection with Camp Pinnacle and other adjacent landowners.
Tory Cave (TC)	TBD	H	0.27	<ul style="list-style-type: none"> • Additional plant surveys to be conducted prior to construction. • Develop trail in two phases: 1. From Indian Ladder Trail to Tory Cave; 2. Continue from Tory Cave to connection with Horseshoe I picnic area.
Yellow (Y)	Yellow	H, B, SS, XC	1.43	<ul style="list-style-type: none"> • Reblaze W7 as part of Yellow Trail. • Close and restore northern section of trail. • Re-align trail section east of Blue Trail to bring trail up slope out of flat, wet area and provide visual access to escarpment (consider interpretation in this vicinity); close and restore original alignment. • Water management techniques including minor realignments should be used to reduce wet areas along this trail. Some significant improvements are currently underway including installation of culverts and a boardwalk.
Suto Road (existing W1)	White	SS, XC, SM	0.30	<ul style="list-style-type: none"> • Road is maintained for water line access. • Designate as a winter only trail.
Existing W3	Change to Red in new alignment		Part of Red Trail	<ul style="list-style-type: none"> • Re-align trail to the east: finalize new trail alignment including interesting features and access to scenic views as possible; includes small seasonal stream crossing; develop as singletrack trail. • Install intersection signage and blazing. • Blaze as part of Red Trail. • Close and restore original alignment.
Existing W4	Change to Lime Green		Part of Nature Trail	<ul style="list-style-type: none"> • Reblaze as part of the Nature Trail. • Reestablish an outslope along sections where berm is built up.

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Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
Existing W5	Change to Long Path	H, B, SS, XC	Part of Long Path	<ul style="list-style-type: none"> • Install additional blazing as necessary. • Remove any blazing making connection with Orange Trail (this short section of trail to be closed). • Improve drainage and cross slope of tread.
Existing W7	Change to Yellow		Part of Yellow Trail	<ul style="list-style-type: none"> • Reblaze as part of Yellow Trail. • Realign short section of trail slightly up hill around wet area.
Existing W8				<ul style="list-style-type: none"> • Develop accessible pathway to waterfall destination location at Hop Field with turnaround platform.
Existing W2, W6, and trail between Knowles Flats and Paint Mine.				<ul style="list-style-type: none"> • Close and restore these corridors.

Types of Use: H (Hiking), B (Biking), SS (Snowshoeing), XC (Cross-country skiing), SM (Snowmobiling)

*Uses noted in () indicate only a portion of that trail is open to the use.

** Mileage calculations include portions of conceptual trail alignments. Final mileage calculations may differ when trails are developed.

Bike Path – Phase I: Develop bike path in main section of Thacher from Lagrange Bush to the Hailes Cave area. Phase II: Develop bike path further north and west making connection to Thompsons’ Lake SP via the Salisbury Trail. The bike path alignment will cross Ketcham Road near the Schoolhouse and then will follow the town road to the Nature Center; install signage/blazing along the town road. Trail will be developed as accessible to the extent possible but may have limitations due to terrain.

Mountain Biking Skills Park and looped trail system with technical features - The area near the Carrick Road Trailhead has been identified as a potential location for development of this facility. Park management will work with staff and local mountain biking groups who have expertise in this area to further assess the location and design and develop the skills park and looped trails with technical features.

Visitor Center - Appropriate trail connections to and circulation near the new Visitor Center will be included during the site design stage. This will include access to the Escarpment Trail, Indian Ladder and Tory Cave Trails and the new bike path.

Destination Locations – Specific locations throughout the trail system have been identified as providing unique opportunities for visitors to experience connections with nature. Improved access, upgrades, destination signage and/or interpretation will be implemented for the following locations:

Northern Thacher:

- Area of Maple-Basswood Rich Mesic Forest (mature) ecological community
- Pond overlook along the Perimeter Trail
- High Point and Hang Glider Overlooks

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Southern Thacher:

- Waterfall at Hop Field – develop an accessible pathway from the parking lot to the waterfall with a turnaround platform.
- Waterfall at Paint Mine – develop an accessible pathway from the parking lot to the waterfall; construct a second bridge closer to waterfall to provide a scenic platform to view falls and enhance connection with picnic area and connection to the trail system (site design will consider future special event use (ie. weddings)).
- Upper Waterfall at Paint Mine – open up vista for falls viewing.
- Waterfall near Yellow Rocks – develop pathway to and viewing area at falls location.
- Gorge feature at western intersection of Nature Trail and Long Path – remove vegetation and provide better access to water and geologic features near this intersection.
- Wetland to west of the Blue Trail (southern Thacher) – upgrade trail access and develop an overlook platform of the wetland for wildlife viewing.
- Onondaga Escarpment section along Yellow Trail – re-alignment of this short section of trail will improve tread conditions as well as provide visitor access to a section of this unique escarpment; interpretation may be added at this location to interpret the geologic formation and flora and fauna of the area.

Other locations will be considered as the trail system implementation projects progress. The Friends Group may consider developing a brochure or map (ie. Hiking Guide to Thacher State Park) which identifies the locations and provides information about these unique features.

Winter Accommodations – The new Visitor Center will act as a warming hut in the winter for the main part of Thacher. The current small room in the restroom building at Hop Field will be replaced with a year-round facility that will act as a warming hut in the winter. Restrooms at Paint Mine will continue to be open and heated during the winter months.

Snowmobile Trailer Parking – trailer parking will remain available at the Paint Mine, Carrick Road, Old Stage Road and Ryan Road trailheads.

Climbing Access Trails - The master plan calls for introduction of rock climbing to the escarpment area. As further assessments occur and specific locations are identified, climber access only trails may be developed. These would not be open for general public use. In some cases, climber access trails may co-align with existing designated trails and support both general public use and climbers.

External Trail Connections – These connections are important ways of expanding the public trail network opportunities in the vicinity of the park. The Long Path alignment through Thacher Park remains an integral part of the trail system and park staff will continue to coordinate with Long Path volunteers. Park management will work with adjacent landowners, including Camp Pinnacle, and local user groups (ie. snowmobile clubs) to explore additional external trail connections. Park management continues to explore opportunities of connecting the trail system to Route 156 through acquisition and/or easements.

External connections with public transportation will be considered as demand warrants.

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Table 3: Implementation Steps for Trails at the campground

Trail Name	Blaze	Allowed Uses*	Mileage**	Implementation Steps
Campground (C)	Blue	H, SS, XC	0.76	<ul style="list-style-type: none"> Water management techniques, including treadway improvement, should be used to reduce wet areas; turnpikes, puncheon and boardwalks may be considered to improve trail conditions.
Lake Shore (LS)	Lime Green	H, SS	0.04	<ul style="list-style-type: none"> Maintain appropriate corridor width; sections are overgrown.
Meadow Loop (ML)	Red	H, (B), SS, XC	0.95	<ul style="list-style-type: none"> Water management techniques, including treadway improvement, should be used to address any wet areas. One section of this trail will co-align with the new bike path.
Nature Center (NC)	Orange	H, (B), SS, XC	1.26	<ul style="list-style-type: none"> Reblaze portions of the Schoolhouse Trail and W7 orange to make this a loop trail. Reestablish drainage ditch and cross slope along eastern boundary to manage water flow. Enhance interpretive signage to include historic, cultural, agricultural and natural resource information.
Schoolhouse (SH)	Yellow	H, SS, XC	0.37	<ul style="list-style-type: none"> Remove yellow blazing from portions newly blazed orange as Nature Center Trail. Enhance interpretive signage to include historic, agricultural and natural resource information.
Existing W9 (W9)	White	H, SS, XC	0.13	<ul style="list-style-type: none"> Consider renaming trail. This short connector is used to provide a small loop trail for school group programming.
Existing W8				<ul style="list-style-type: none"> Close and restore corridor.
Bike Path	TBD	H, B, SS, XC	XX	<ul style="list-style-type: none"> Part of Phase II: Develop bike path providing connection from Thacher SP past the School House to Nature Center and camping area; bike path alignment follows town road from Ketcham Road to Nature Center; install signage/blazing along road.

Types of Use: H (Hiking), B (Biking), SS (Snowshoeing), XC (Cross-country skiing)

*Uses noted in () indicate only a portion of that trail is open to the use.

** Mileage calculations include portions of conceptual trail alignments. Final mileage calculations may differ when trails are developed.

Winter Accommodations – The Emma Treadwell Thacher Nature Center is open year-round and will continue to act as a warming hut during winter months.

General Trail System upgrades

Signage - Trailhead and intersection signage will be installed at appropriate locations throughout the park. In some cases, mileage markers may be installed to enhance the user experience and for

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Appendix A – Trail System Implementation

safety and emergency purposes. Trail system orientation signage will be installed at key locations such as near the new Visitor Center, at entrances to the trail system, adjacent to the campground contact station, and near the beach area. This will help inform visitors of the trail opportunities in the parks. Directional destination signage will also be installed along the pathway system within the camping area to better inform campers of the location of recreational and facility resources in the park. As needed, signage may be installed to educate users on proper trail etiquette, such as indicating caution on multi-use trails that include both motorized and non-motorized uses in winter and/or such as cross-country skiers to the right and snowshoers to the left on trails that accommodate only non-motorized use in winter.

Interpretive Programming – Interpretive opportunities will be enhanced in the park through various means which may include interpretive signage at key locations, development of interpretive brochures or self-guided map brochures, and/or with technology such as scannable QR codes for smartphones or cell phone tours (if cell reception improves in the area). Park management and the Friends Group will continue to offer guided interpretive programming as well as expand opportunities in the park.

Partnerships – Park management will continue to foster and expand relationships with partner organizations and volunteers to help improve and maintain the trail system. If there is public interest, a trail advisory group or trail stewards program could be developed representing the various user groups to assist staff in coordinating and implementing trail projects.

Trail maintenance - Water management and erosion control techniques (as noted in the above tables) may include installation of culverts, minor reroutes, surfacing or other improvements to the trail tread (installation of turnpikes, puncheon or boardwalk, hardening trail surface with rocks), debarment and reestablishing an outslope, and diversion of water flow by development or repair of ditches, knicks or rolling grade dips, among other maintenance activities.

Appendix B – Soil Descriptions and Limitations

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Soil Descriptions (major map units only)

Ae—Allis silt loam

Component: Allis

The Allis component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on depressions. The parent material consists of clayey till derived mainly from acid shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria.

AnB—Angola silt loam, 3 to 8 percent slopes

Component: Angola

The Angola component makes up 90 percent of the map unit. Slopes are 3 to 8 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till derived mainly from shale and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria.

AnC—Angola silt loam, 8 to 15 percent slopes

Component: Angola (85%)

The Angola component makes up 85 percent of the map unit. Slopes are 8 to 15 percent. This component is on benches, ridges, till plains. The parent material consists of loamy till derived mainly from shale and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

AsB—Arnot-Rock outcrop complex, 0 to 8 percent slopes

Component: Arnot (50%)

The Arnot component makes up 50 percent of the map unit. Slopes are 0 to 8 percent. This component is on hills, ridges, benches. The parent material consists of loamy till derived mainly from acid sandstone, siltstone, and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface

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Appendix B – Soil Descriptions and Limitations

horizon is about 5 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

AsF—Arnot-Rock outcrop complex, 25 to 70 percent slopes

Component: Arnot (35%)

The Arnot component makes up 35 percent of the map unit. Slopes are 25 to 70 percent. This component is on benches, ridges, hills. The parent material consists of loamy till derived mainly from acid sandstone, siltstone, and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

BuA—Burdett silt loam, 0 to 3 percent slopes

Component: Burdett (85%)

The Burdett component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on drumlinoid ridges, hills, till plains. The parent material consists of a thin silt mantle overlying till that is strongly influenced by shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria.

BuB—Burdett silt loam, 3 to 8 percent slopes

Component: Burdett (85%)

The Burdett component makes up 85 percent of the map unit. Slopes are 3 to 8 percent. This component is on till plains, hills, drumlinoid ridges. The parent material consists of a thin silt mantle overlying till that is strongly influenced by shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria.

BuC—Burdett silt loam, 8 to 15 percent slopes

Component: Burdett (85%)

The Burdett component makes up 85 percent of the map unit. Slopes are 8 to 15 percent. This component is on drumlinoid ridges, hills, till plains. The parent material consists of a thin silt mantle overlying till that is strongly influenced by shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

CkB—Chenango channery silt loam, fan, 3 to 8 percent slopes

Component: Chenango, fan (85%)

The Chenango, fan component makes up 85 percent of the map unit. Slopes are 3 to 8 percent. This component is on alluvial fans. The parent material consists of gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water

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movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during April, May. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.

FaB—Farmington silt loam, 0 to 8 percent slopes

Component: Farmington (85%)

The Farmington component makes up 85 percent of the map unit. Slopes are 0 to 8 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

FrB—Farmington-Rock outcrop complex, 0 to 8 percent slopes

Component: Farmington (50%)

The Farmington component makes up 50 percent of the map unit. Slopes are 0 to 8 percent. This component is on benches, ridges, till plains. The parent material consists of loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

FrC—Farmington-Rock outcrop complex, 8 to 15 percent slopes

Component: Farmington (45%)

The Farmington component makes up 45 percent of the map unit. Slopes are 8 to 15 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

FrF—Farmington-Rock outcrop complex, 25 to 60 percent slope

Component: Farmington (45%)

The Farmington component makes up 45 percent of the map unit. Slopes are 25 to 60 percent. This component is on benches, ridges, till plains. The parent material consists of loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

FwC—Farmington-Wassaic-Rock outcrop complex, rolling

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Component: Farmington (35%)

The Farmington component makes up 35 percent of the map unit. Slopes are 8 to 15 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Component: Wassaic (30%)

The Wassaic component makes up 30 percent of the map unit. Slopes are 8 to 15 percent. This component is on benches, ridges, till plains. The parent material consists of loamy till derived mainly from limestone, with varying amounts of sandstone, shale, and crystalline rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 26 inches during March, April. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

HnA—Hornell silt loam, 0 to 3 percent slopes

Component: Hornell (90%)

The Hornell component makes up 90 percent of the map unit. Slopes are 0 to 3 percent. This component is on till plains, ridges, benches. The parent material consists of clayey till, or till and residuum, derived from acid shale and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria.

In—Ilion silt loam

Component: Ilion (90%)

The Ilion component makes up 90 percent of the map unit. Slopes are 0 to 3 percent. This component is on depressions. The parent material consists of loamy till derived from calcareous dark shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent.

KeB—Kearsarge silt loam, 0 to 8 percent slopes

Component: Kearsarge (80%)

The Kearsarge component makes up 80 percent of the map unit. Slopes are 0 to 8 percent. This component is on hills, ridges. The parent material consists of loamy till derived from siltstone, sandstone, and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria.

LoB—Lordstown channery silt loam, 3 to 8 percent slopes

Component: Lordstown (85%)

The Lordstown component makes up 85 percent of the map unit. Slopes are 3 to 8 percent. This component is on benches, ridges, hills. The parent material consists of loamy till derived from sandstone and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

LoC—Lordstown channery silt loam, 8 to 15 percent slopes

Component: Lordstown (85%)

The Lordstown component makes up 85 percent of the map unit. Slopes are 8 to 15 percent. This component is on hills, ridges, benches. The parent material consists of loamy till derived from sandstone and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

LoD—Lordstown channery silt loam, 15 to 25 percent slopes

Component: Lordstown (85%)

The Lordstown component makes up 85 percent of the map unit. Slopes are 15 to 25 percent. This component is on benches, ridges, hills. The parent material consists of loamy till derived from sandstone and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

LrE—Lordstown-Arnot complex, 25 to 45 percent slopes, very rocky

Component: Lordstown (45%)

The Lordstown component makes up 45 percent of the map unit. Slopes are 25 to 45 percent. This component is on hills, ridges, benches. The parent material consists of loamy till derived from sandstone and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Component: Arnot (25%)

The Arnot component makes up 25 percent of the map unit. Slopes are 25 to 45 percent. This component is on benches, ridges, hills. The parent material consists of loamy till derived mainly from acid sandstone, siltstone, and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Ma—Madalin silt loam

Component: Madalin (80%)

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The Madalin component makes up 80 percent of the map unit. Slopes are 0 to 3 percent. This component is on depressions. The parent material consists of clayey and silty glaciolacustrine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent.

MbC—Manlius channery silt loam, 8 to 15 percent slopes

Component: Manlius (85%)

The Manlius component makes up 85 percent of the map unit. Slopes are 8 to 15 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till derived mainly from local acid shale bedrock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

MbE—Manlius channery silt loam, 25 to 35 percent slopes

Component: Manlius (85%)

The Manlius component makes up 85 percent of the map unit. Slopes are 25 to 35 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till derived mainly from local acid shale bedrock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Mk—Middlebury silt loam

Component: Middlebury (85%)

The Middlebury component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains. The parent material consists of loamy alluvium predominantly from areas of shale and sandstone with some lime-bearing material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 15 inches during February, March, April. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria.

NaB—Nassau channery silt loam, undulating

Component: Nassau, undulating (80%)

The Nassau, undulating component makes up 80 percent of the map unit. Slopes are 3 to 8 percent. This component is on benches, ridges, till plains. The parent material consists of channery loamy till derived mainly from local slate or shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

NaC—Nassau channery silt loam, rolling

Component: Nassau, rolling (85%)

The Nassau, rolling component makes up 85 percent of the map unit. Slopes are 3 to 15 percent. This component is on till plains, ridges, benches. The parent material consists of channery loamy till derived mainly from local slate or shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

NrD—Nassau very channery silt loam, hilly, very rocky

Component: Nassau, hilly (70%)

The Nassau, hilly component makes up 70 percent of the map unit. Slopes are 15 to 25 percent. This component is on till plains, ridges, benches. The parent material consists of channery loamy till derived mainly from local slate or shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

NuB—Nunda silt loam, 3 to 8 percent slopes

Component: Nunda (85%)

The Nunda component makes up 85 percent of the map unit. Slopes are 3 to 8 percent. This component is on hills, till plains, drumlinoid ridges. The parent material consists of a silty mantle over loamy till derived from calcareous shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

NuC—Nunda silt loam, 8 to 15 percent slopes

Component: Nunda (90%)

The Nunda component makes up 90 percent of the map unit. Slopes are 8 to 15 percent. This component is on drumlinoid ridges, till plains, hills. The parent material consists of a silty mantle over loamy till derived from calcareous shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

NuD—Nunda silt loam, 15 to 25 percent slopes

Component: Nunda (85%)

The Nunda component makes up 85 percent of the map unit. Slopes are 15 to 25 percent. This component is on hills, till plains, drumlinoid ridges. The parent material consists of a silty mantle over loamy till derived from calcareous shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during

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March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

NuE—Nunda silt loam, 25 to 35 percent slopes

Component: Nunda (75%)

The Nunda component makes up 75 percent of the map unit. Slopes are 25 to 35 percent. This component is on drumlinoid ridges, till plains, hills. The parent material consists of a silty mantle over loamy till derived from calcareous shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

NvC—Nunda silt loam, 3 to 15 percent slopes, very stony

Component: Nunda, very stony (80%)

The Nunda, very stony component makes up 80 percent of the map unit. Slopes are 3 to 15 percent. This component is on hills, till plains, drumlinoid ridges. The parent material consists of a silty mantle over loamy till derived from calcareous shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

NvE—Nunda silt loam, 15 to 35 percent slopes, very stony

Component: Nunda, very stony (85%)

The Nunda, very stony component makes up 85 percent of the map unit. Slopes are 15 to 35 percent. This component is on drumlinoid ridges, till plains, hills. The parent material consists of a silty mantle over loamy till derived from calcareous shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

RhB—Rhinebeck silty clay loam, 3 to 8 percent slopes

Component: Rhinebeck (85%)

The Rhinebeck component makes up 85 percent of the map unit. Slopes are 3 to 8 percent. This component is on lake plains. The parent material consists of clayey and silty glaciolacustrine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent.

TuB—Tuller-Greene complex, 0 to 8 percent slopes

Component: Tuller (45%)

The Tuller component makes up 45 percent of the map unit. Slopes are 0 to 8 percent. This component is on benches, ridges, hills. The parent material consists of loamy till derived mainly from acid sandstone, siltstone, and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural

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drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 9 inches during January, February, March, April, May, June, December. Organic matter content in the surface horizon is about 7 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria.

Component: Greene (30%)

The Greene component makes up 30 percent of the map unit. Slopes are 0 to 8 percent. This component is on hills, ridges, benches. The parent material consists of loamy till derived mainly from sandstone and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 9 inches during January, February, March, April, May, June, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria.

Ug—Udorthents, loamy

Component: Udorthents, loamy (90%)

The Udorthents, loamy component makes up 90 percent of the map unit. Slopes are 0 to 8 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 3 percent. This soil does not meet hydric criteria.

WcA—Wassaic silt loam, 0 to 3 percent slopes

Component: Wassaic (85%)

The Wassaic component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on benches, ridges, till plains. The parent material consists of loamy till derived mainly from limestone, with varying amounts of sandstone, shale, and crystalline rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 26 inches during March, April. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.

WcB—Wassaic silt loam, 3 to 8 percent slopes

Component: Wassaic (90%)

The Wassaic component makes up 90 percent of the map unit. Slopes are 3 to 8 percent. This component is on till plains, ridges, benches. The parent material consists of loamy till derived mainly from limestone, with varying amounts of sandstone, shale, and crystalline rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 26 inches during March, April. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

WcC—Wassaic silt loam, 8 to 15 percent slopes

Component: Wassaic (90%)

The Wassaic component makes up 90 percent of the map unit. Slopes are 8 to 15 percent. This component is on benches, ridges, till plains. The parent material consists of loamy till derived mainly from limestone, with varying amounts of sandstone, shale, and crystalline rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water

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movement in the most restrictive layer is very low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 26 inches during March, April. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Data Source Information

Soil Survey Area: Albany County, New York

Survey Area Data: Version 10, Dec 19, 2011

Soil Limitations

The soils of the survey area are rated in this table according to limitations that affect their suitability for various recreation types. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in the table can be supplemented by other information, for example, interpretations for dwellings without basements, for local roads and streets, and for septic tank absorption fields.

Camp Areas, Picnic Areas, and Playgrounds

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, saturated hydraulic conductivity (Ksat), and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, Ksat, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing

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picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, Ksat, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, Ksat, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, Ksat, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, Ksat, and toxic substances in the soil.

Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ae—Allis silt loam							
Allis	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Gravel	0.06
AnB—Angola silt loam, 3 to 8 percent slopes							
Angola	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Slope	0.88
						Depth to bedrock	0.84

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Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnC—Angola silt loam, 8 to 15 percent slopes							
Angola	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.96
						Depth to bedrock	0.84
AsB—Arnot-Rock outcrop complex, 0 to 8 percent slopes							
Arnot	50	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
AsF—Arnot-Rock outcrop complex, 25 to 70 percent slopes							
Arnot	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Gravel	1.00	Gravel	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Rock outcrop	35	Not rated		Not rated		Not rated	
BuA—Burdett silt loam, 0 to 3 percent slopes							
Burdett	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
BuB—Burdett silt loam, 3 to 8 percent slopes							
Burdett	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Slope	0.88

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Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BuC—Burdett silt loam, 8 to 15 percent slopes							
Burdett	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.96
ChA—Chenango gravelly silt loam, loamy substratum, 0 to 3 percent slopes							
Chenango, loamy substratum	90	Somewhat limited		Somewhat limited		Very limited	
		Gravel	0.20	Gravel	0.20	Gravel	1.00
ChB—Chenango gravelly silt loam, loamy substratum, 3 to 8 percent slopes							
Chenango, loamy substratum	90	Somewhat limited		Somewhat limited		Very limited	
		Gravel	0.20	Gravel	0.20	Gravel	1.00
						Slope	1.00
CkB—Chenango channery silt loam, fan, 3 to 8 percent slopes							
Chenango, fan	85	Somewhat limited		Somewhat limited		Very limited	
		Gravel	0.20	Gravel	0.20	Gravel	1.00
						Slope	1.00
FaB—Farmington silt loam, 0 to 8 percent slopes							
Farmington	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.50
FrB—Farmington-Rock outcrop complex, 0 to 8 percent slopes							
Farmington	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.50
Rock outcrop	25	Not rated		Not rated		Not rated	

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Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrC—Farmington-Rock outcrop complex, 8 to 15 percent slopes							
Farmington	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
Rock outcrop	25	Not rated		Not rated		Not rated	
FrF—Farmington-Rock outcrop complex, 25 to 60 percent slope							
Farmington	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
FwC—Farmington-Wassaic-Rock outcrop complex, rolling							
Farmington	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
Wassaic	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Depth to saturated zone	0.16	Depth to saturated zone	0.08	Depth to bedrock	0.46
						Depth to saturated zone	0.16
Rock outcrop	15	Not rated		Not rated		Not rated	
HnA—Hornell silt loam, 0 to 3 percent slopes							
Hornell	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
In—Ilion silt loam							
Ilion	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96

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Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeB—Kearsarge silt loam, 0 to 8 percent slopes							
Kearsarge	80	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.88
						Gravel	0.18
LoB—Lordstown channery silt loam, 3 to 8 percent slopes							
Lordstown	85	Somewhat limited		Somewhat limited		Very limited	
		Gravel	0.22	Gravel	0.22	Gravel	1.00
						Slope	1.00
						Depth to bedrock	0.46
LoC—Lordstown channery silt loam, 8 to 15 percent slopes							
Lordstown	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Gravel	0.22	Gravel	0.22	Gravel	1.00
						Depth to bedrock	0.46
LoD—Lordstown channery silt loam, 15 to 25 percent slopes							
Lordstown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel	0.22	Gravel	0.22	Gravel	1.00
						Depth to bedrock	0.46

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Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LrE—Lordstown-Arnot complex, 25 to 45 percent slopes, very rocky							
Lordstown	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel	0.22	Gravel	0.22	Gravel	1.00
						Depth to bedrock	0.46
Arnot	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Gravel	1.00	Gravel	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Ma—Madalin silt loam							
Madalin	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
MbC—Manlius channery silt loam, 8 to 15 percent slopes							
Manlius	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Gravel	0.99
						Depth to bedrock	0.90
MbE—Manlius channery silt loam, 25 to 35 percent slopes							
Manlius	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.99
						Depth to bedrock	0.90
Mh—Medihemists and Hydraquents, ponded							
Medihemists, ponded	45	Not rated		Not rated		Not rated	
Hydraquents	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00

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Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mk—Middlebury silt loam							
Middlebury	85	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
		Flooding	1.00			Flooding	0.60
NaB—Nassau channery silt loam, undulating							
Nassau, undulating	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.38	Gravel	0.38	Gravel	1.00
						Slope	1.00
NaC—Nassau channery silt loam, rolling							
Nassau, rolling	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Gravel	1.00
		Gravel	0.38	Gravel	0.38	Slope	1.00
NrD—Nassau very channery silt loam, hilly, very rocky							
Nassau, hilly	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel	0.99	Gravel	0.99	Depth to bedrock	1.00
NuB—Nunda silt loam, 3 to 8 percent slopes							
Nunda	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	0.88
		Depth to saturated zone	0.77	Depth to saturated zone	0.43	Gravel	0.22
						Slow water movement	0.26
						Depth to saturated zone	0.77

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Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NuC—Nunda silt loam, 8 to 15 percent slopes							
Nunda	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Gravel	0.22
		Depth to saturated zone	0.77	Depth to saturated zone	0.43	Slow water movement	0.26
						Depth to saturated zone	0.77
NuD—Nunda silt loam, 15 to 25 percent slopes							
Nunda	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Gravel	0.22
		Depth to saturated zone	0.77	Depth to saturated zone	0.43	Slow water movement	0.26
						Depth to saturated zone	0.77
NuE—Nunda silt loam, 25 to 35 percent slopes							
Nunda	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Gravel	0.22
		Depth to saturated zone	0.77	Depth to saturated zone	0.43	Slow water movement	0.26
						Depth to saturated zone	0.77
NvC—Nunda silt loam, 3 to 15 percent slopes, very stony							
Nunda, very stony	80	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.53	Large stones content	0.53	Slope	1.00
		Slope	0.04	Slope	0.04	Large stones content	0.53
		Slow water movement	0.26	Slow water movement	0.26	Gravel	0.22
		Depth to saturated zone	0.77	Depth to saturated zone	0.43	Slow water movement	0.26
						Depth to saturated zone	0.77

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Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NvE—Nunda silt loam, 15 to 35 percent slopes, very stony							
Nunda, very stony	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
		Slow water movement	0.26	Slow water movement	0.26	Gravel	0.22
		Depth to saturated zone	0.77	Depth to saturated zone	0.43	Slow water movement	0.26
						Depth to saturated zone	0.77
Pn—Pits, quarry							
Pits, quarry	100	Not rated		Not rated		Not rated	
Ra—Raynham very fine sandy loam							
Raynham, poorly drained	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
Raynham, somewhat poorly drained	30	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Slow water movement	0.96	Depth to saturated zone	1.00
		Slow water movement	0.96	Depth to saturated zone	0.99	Slow water movement	0.96
RhB—Rhinebeck silty clay loam, 3 to 8 percent slopes							
Rhinebeck	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Slope	0.50
Te—Teel silt loam							
Teel	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.43	Depth to saturated zone	0.77
		Depth to saturated zone	0.77			Flooding	0.60

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Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuB—Tuller-Greene complex, 0 to 8 percent slopes							
Tuller	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slow water movement	0.49	Slow water movement	0.49	Depth to bedrock	1.00
		Gravel	0.01	Gravel	0.01	Slope	0.50
						Slow water movement	0.49
Greene	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
						Depth to bedrock	0.90
						Gravel	0.68
						Slope	0.50
Ug—Udorthents, loamy							
Udorthents, loamy	90	Not limited		Not limited		Somewhat limited	
						Gravel	0.04
UnB—Unadilla silt loam, 3 to 8 percent slopes							
Unadilla	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Ur—Urban land							
Urban land	85	Not rated		Not rated		Not rated	
VaB—Valois gravelly loam, 3 to 8 percent slopes							
Valois	80	Somewhat limited		Somewhat limited		Very limited	
		Gravel	0.08	Gravel	0.08	Gravel	1.00
						Slope	1.00
W—Water							
Water	100	Not rated		Not rated		Not rated	

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Camp Areas, Picnic Areas, and Playgrounds– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcA—Wassaic silt loam, 0 to 3 percent slopes							
Wassaic	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.16	Depth to saturated zone	0.08	Depth to saturated zone	0.16
WcB—Wassaic silt loam, 3 to 8 percent slopes							
Wassaic	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.16	Depth to saturated zone	0.08	Slope	1.00
						Depth to bedrock	0.46
						Depth to saturated zone	0.16
WcC—Wassaic silt loam, 8 to 15 percent slopes							
Wassaic	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Depth to saturated zone	0.16	Depth to saturated zone	0.08	Depth to bedrock	0.46
						Depth to saturated zone	0.16

Source - NRCS, 2011

Paths and Trails

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodability. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer. *Off-road motorcycle trails* require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodability, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ae—Allis silt loam							
Allis	85	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
						Depth to bedrock	0.16
AnB—Angola silt loam, 3 to 8 percent slopes							
Angola	90	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
						Depth to bedrock	0.84
AnC—Angola silt loam, 8 to 15 percent slopes							
Angola	85	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
						Depth to bedrock	0.84
						Slope	0.63
AsB—Arnot-Rock outcrop complex, 0 to 8 percent slopes							
Arnot	50	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
						Large stones	0.54
Rock outcrop	30	Not rated				Not rated	

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AsF—Arnot-Rock outcrop complex, 25 to 70 percent slopes							
Arnot	35	Very limited				Very limited	
		Slope	1.00			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
						Gravel	1.00
						Large stones	0.54
Rock outcrop	35	Not rated				Not rated	
BuA—Burdett silt loam, 0 to 3 percent slopes							
Burdett	85	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
BuB—Burdett silt loam, 3 to 8 percent slopes							
Burdett	85	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
BuC—Burdett silt loam, 8 to 15 percent slopes							
Burdett	85	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
						Slope	0.63
ChA—Chenango gravelly silt loam, loamy substratum, 0 to 3 percent slopes							
Chenango, loamy substratum	90	Not limited				Somewhat limited	
						Droughty	0.18
						Gravel	0.20

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChB—Chenango gravelly silt loam, loamy substratum, 3 to 8 percent slopes							
Chenango, loamy substratum	90	Not limited				Somewhat limited	
						Droughty	0.18
						Gravel	0.20
CkB—Chenango channery silt loam, fan, 3 to 8 percent slopes							
Chenango, fan	85	Not limited				Somewhat limited	
						Droughty	0.18
						Gravel	0.20
FaB—Farmington silt loam, 0 to 8 percent slopes							
Farmington	85	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	0.78
FrB—Farmington-Rock outcrop complex, 0 to 8 percent slopes							
Farmington	50	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	0.78
Rock outcrop	25	Not rated				Not rated	
FrC—Farmington-Rock outcrop complex, 8 to 15 percent slopes							
Farmington	45	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	0.78
						Slope	0.63
Rock outcrop	25	Not rated				Not rated	

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrF—Farmington-Rock outcrop complex, 25 to 60 percent slope							
Farmington	45	Very limited				Very limited	
		Slope	1.00			Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.78
Rock outcrop	30	Not rated				Not rated	
FwC—Farmington-Wassaic-Rock outcrop complex, rolling							
Farmington	35	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	0.78
						Slope	0.63
Wassaic	30	Not limited				Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.46
						Depth to saturated zone	0.08
Rock outcrop	15	Not rated				Not rated	
HnA—Hornell silt loam, 0 to 3 percent slopes							
Hornell	90	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
						Depth to bedrock	0.65
						Droughty	0.06
In—Ilion silt loam							
Ilion	90	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
KeB—Kearsarge silt loam, 0 to 8 percent slopes							
Kearsarge	80	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	0.76

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LoB—Lordstown channery silt loam, 3 to 8 percent slopes							
Lordstown	85	Not limited				Somewhat limited	
						Depth to bedrock	0.46
						Gravel	0.22
LoC—Lordstown channery silt loam, 8 to 15 percent slopes							
Lordstown	85	Not limited				Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.46
						Gravel	0.22
LoD—Lordstown channery silt loam, 15 to 25 percent slopes							
Lordstown	85	Somewhat limited				Very limited	
		Slope	0.50			Slope	1.00
						Depth to bedrock	0.46
						Gravel	0.22
LrE—Lordstown-Arnot complex, 25 to 45 percent slopes, very rocky							
Lordstown	45	Very limited				Very limited	
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.46
						Gravel	0.22
Arnot	25	Very limited				Very limited	
		Slope	1.00			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
						Gravel	1.00
						Large stones	0.54
Ma—Madalin silt loam							
Madalin	80	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MbC—Manlius channery silt loam, 8 to 15 percent slopes							
Manlius	85	Not limited				Somewhat limited	
						Depth to bedrock	0.90
						Droughty	0.83
						Slope	0.63
MbE—Manlius channery silt loam, 25 to 35 percent slopes							
Manlius	85	Very limited				Very limited	
		Slope	1.00			Slope	1.00
						Depth to bedrock	0.90
						Droughty	0.83
Mh—Medihemists and Hydraquents, ponded							
Medihemists, ponded	45	Not rated				Not rated	
Hydraquents	35	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
Mk—Middlebury silt loam							
Middlebury	85	Somewhat limited				Somewhat limited	
		Depth to saturated zone	0.86			Depth to saturated zone	0.94
						Flooding	0.60
NaB—Nassau channery silt loam, undulating							
Nassau, undulating	80	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Gravel	0.38
						Large stones	0.08

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NaC—Nassau channery silt loam, rolling							
Nassau, rolling	85	Not limited				Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	0.63
						Gravel	0.38
						Large stones	0.08
NrD—Nassau very channery silt loam, hilly, very rocky							
Nassau, hilly	70	Somewhat limited				Very limited	
		Slope	0.50			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
						Gravel	0.99
						Large stones	0.68
NuB—Nunda silt loam, 3 to 8 percent slopes							
Nunda	85	Somewhat limited				Somewhat limited	
		Depth to saturated zone	0.08			Depth to saturated zone	0.43
NuC—Nunda silt loam, 8 to 15 percent slopes							
Nunda	90	Somewhat limited				Somewhat limited	
		Depth to saturated zone	0.08			Slope	0.63
						Depth to saturated zone	0.43
NuD—Nunda silt loam, 15 to 25 percent slopes							
Nunda	85	Somewhat limited				Very limited	
		Slope	0.50			Slope	1.00
		Depth to saturated zone	0.08			Depth to saturated zone	0.43

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NuE—Nunda silt loam, 25 to 35 percent slopes							
Nunda	75	Very limited				Very limited	
		Slope	1.00			Slope	1.00
		Depth to saturated zone	0.08			Depth to saturated zone	0.43
NvC—Nunda silt loam, 3 to 15 percent slopes, very stony							
Nunda, very stony	80	Somewhat limited				Somewhat limited	
		Large stones content	0.53			Slope	0.04
		Depth to saturated zone	0.08			Depth to saturated zone	0.43
NvE—Nunda silt loam, 15 to 35 percent slopes, very stony							
Nunda, very stony	85	Very limited				Very limited	
		Slope	1.00			Slope	1.00
		Large stones content	0.53			Depth to saturated zone	0.43
		Depth to saturated zone	0.08				
Pn—Pits, quarry							
Pits, quarry	100	Not rated				Not rated	
Ra—Raynham very fine sandy loam							
Raynham, poorly drained	50	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
Raynham, somewhat poorly drained	30	Somewhat limited				Somewhat limited	
		Depth to saturated zone	0.98			Depth to saturated zone	0.99
RhB—Rhinebeck silty clay loam, 3 to 8 percent slopes							
Rhinebeck	85	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Te—Teel silt loam							
Teel	80	Somewhat limited				Somewhat limited	
		Depth to saturated zone	0.08			Flooding	0.60
						Depth to saturated zone	0.43
TuB—Tuller-Greene complex, 0 to 8 percent slopes							
Tuller	45	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to bedrock	1.00
						Depth to saturated zone	1.00
						Droughty	1.00
						Gravel	0.01
						Large stones	0.08
Greene	30	Very limited				Very limited	
		Depth to saturated zone	1.00			Depth to saturated zone	1.00
						Depth to bedrock	0.90
						Droughty	0.07
Ug—Udorthents, loamy							
Udorthents, loamy	90	Not limited				Somewhat limited	
						Droughty	0.06
UnB—Unadilla silt loam, 3 to 8 percent slopes							
Unadilla	85	Not limited				Not limited	
Ur—Urban land							
Urban land	85	Not rated				Not rated	
VaB—Valois gravelly loam, 3 to 8 percent slopes							
Valois	80	Not limited				Somewhat limited	
						Gravel	0.08
W—Water							
Water	100	Not rated				Not rated	

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Paths, Trails, and Golf Fairways– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcA—Wassaic silt loam, 0 to 3 percent slopes							
Wassaic	85	Not limited				Somewhat limited	
						Depth to bedrock	0.46
						Depth to saturated zone	0.08
WcB—Wassaic silt loam, 3 to 8 percent slopes							
Wassaic	90	Not limited				Somewhat limited	
						Depth to bedrock	0.46
						Depth to saturated zone	0.08
WcC—Wassaic silt loam, 8 to 15 percent slopes							
Wassaic	90	Not limited				Somewhat limited	
						Slope	0.63
						Depth to bedrock	0.46
						Depth to saturated zone	0.08

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works. Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

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Dwellings and Small Commercial Buildings– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ae—Allis silt loam							
Allis	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.15	Shrink-swell	0.50	Depth to hard bedrock	0.15
AnB—Angola silt loam, 3 to 8 percent slopes							
Angola	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to hard bedrock	0.84	Depth to hard bedrock	1.00	Slope	0.12
						Depth to hard bedrock	0.84

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Dwellings and Small Commercial Buildings– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnC—Angola silt loam, 8 to 15 percent slopes							
Angola	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
		Depth to hard bedrock	0.84	Slope	0.63	Depth to hard bedrock	0.84
AsB—Arnot-Rock outcrop complex, 0 to 8 percent slopes							
Arnot	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
AsF—Arnot-Rock outcrop complex, 25 to 70 percent slopes							
Arnot	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	35	Not rated		Not rated		Not rated	
BuA—Burdett silt loam, 0 to 3 percent slopes							
Burdett	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
BuB—Burdett silt loam, 3 to 8 percent slopes							
Burdett	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.12
BuC—Burdett silt loam, 8 to 15 percent slopes							
Burdett	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to saturated zone	1.00

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Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChA—Chenango gravelly silt loam, loamy substratum, 0 to 3 percent slopes							
Chenango, loamy substratum	90	Not limited		Not limited		Not limited	
ChB—Chenango gravelly silt loam, loamy substratum, 3 to 8 percent slopes							
Chenango, loamy substratum	90	Not limited		Not limited		Somewhat limited	
						Slope	0.50
CkB—Chenango channery silt loam, fan, 3 to 8 percent slopes							
Chenango, fan	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to saturated zone	0.35	Slope	0.50
FaB—Farmington silt loam, 0 to 8 percent slopes							
Farmington	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
FrB—Farmington-Rock outcrop complex, 0 to 8 percent slopes							
Farmington	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	25	Not rated		Not rated		Not rated	
FrC—Farmington-Rock outcrop complex, 8 to 15 percent slopes							
Farmington	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	1.00
Rock outcrop	25	Not rated		Not rated		Not rated	

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Dwellings and Small Commercial Buildings– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrF—Farmington-Rock outcrop complex, 25 to 60 percent slope							
Farmington	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
FwC—Farmington-Wassaic-Rock outcrop complex, rolling							
Farmington	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	1.00
Wassaic	30	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to saturated zone	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
		Depth to saturated zone	0.16	Slope	0.63	Depth to saturated zone	0.16
Rock outcrop	15	Not rated		Not rated		Not rated	
HnA—Hornell silt loam, 0 to 3 percent slopes							
Hornell	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.64	Shrink-swell	0.50	Depth to hard bedrock	0.64
In—Ilion silt loam							
Ilion	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
KeB—Kearsarge silt loam, 0 to 8 percent slopes							
Kearsarge	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.12

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Dwellings and Small Commercial Buildings– Albany County, New York							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LoB—Lordstown channery silt loam, 3 to 8 percent slopes							
Lordstown	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Slope	0.50
						Depth to hard bedrock	0.46
LoC—Lordstown channery silt loam, 8 to 15 percent slopes							
Lordstown	85	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Slope	0.63	Depth to hard bedrock	0.46
LoD—Lordstown channery silt loam, 15 to 25 percent slopes							
Lordstown	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
LrE—Lordstown-Arnot complex, 25 to 45 percent slopes, very rocky							
Lordstown	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
Arnot	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Ma—Madalin silt loam							
Madalin	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
MbC—Manlius channery silt loam, 8 to 15 percent slopes							
Manlius	85	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.90	Slope	0.63	Depth to hard bedrock	0.90

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Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MbE—Manlius channery silt loam, 25 to 35 percent slopes							
Manlius	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to hard bedrock	0.90
Mh—Medihemists and Hydraquents, ponded							
Medihemists, ponded	45	Very limited		Very limited		Very limited	
		Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Organic matter content	1.00	Organic matter content	1.00	Organic matter content	1.00
Hydraquents	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mk—Middlebury silt loam							
Middlebury	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NaB—Nassau channery silt loam, undulating							
Nassau, undulating	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.50
NaC—Nassau channery silt loam, rolling							
Nassau, rolling	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00

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Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NrD—Nassau very channery silt loam, hilly, very rocky							
Nassau, hilly	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
NuB—Nunda silt loam, 3 to 8 percent slopes							
Nunda	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.77	Depth to saturated zone	1.00	Slope	0.12
						Depth to saturated zone	0.77
NuC—Nunda silt loam, 8 to 15 percent slopes							
Nunda	90	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.77	Slope	0.63	Depth to saturated zone	0.77
NuD—Nunda silt loam, 15 to 25 percent slopes							
Nunda	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to saturated zone	0.77	Depth to saturated zone	1.00	Depth to saturated zone	0.77
NuE—Nunda silt loam, 25 to 35 percent slopes							
Nunda	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to saturated zone	0.77	Depth to saturated zone	1.00	Depth to saturated zone	0.77
NvC—Nunda silt loam, 3 to 15 percent slopes, very stony							
Nunda, very stony	80	Somewhat limited		Very limited		Very limited	
		Slope	0.04	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.77	Slope	0.04	Depth to saturated zone	0.77

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Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NvE—Nunda silt loam, 15 to 35 percent slopes, very stony							
Nunda, very stony	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to saturated zone	0.77	Depth to saturated zone	1.00	Depth to saturated zone	0.77
Pn—Pits, quarry							
Pits, quarry	100	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Ra—Raynham very fine sandy loam							
Raynham, poorly drained	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Raynham, somewhat poorly drained	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RhB—Rhinebeck silty clay loam, 3 to 8 percent slopes							
Rhinebeck	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
Te—Teel silt loam							
Teel	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.77	Depth to saturated zone	1.00	Depth to saturated zone	0.77
TuB—Tuller-Greene complex, 0 to 8 percent slopes							
Tuller	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Greene	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to hard bedrock	0.90	Depth to hard bedrock	1.00	Depth to hard bedrock	0.90

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Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ug—Udorthents, loamy							
Udorthents, loamy	90	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.35		
UnB—Unadilla silt loam, 3 to 8 percent slopes							
Unadilla	85	Not limited		Not limited		Not limited	
Ur—Urban land							
Urban land	85	Not limited		Not limited		Not limited	
VaB—Valois gravelly loam, 3 to 8 percent slopes							
Valois	80	Not limited		Not limited		Somewhat limited	
						Slope	0.50
W—Water							
Water	100	Not rated		Not rated		Not rated	
WcA—Wassaic silt loam, 0 to 3 percent slopes							
Wassaic	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.46	Depth to saturated zone	1.00	Depth to hard bedrock	0.46
		Depth to saturated zone	0.16	Depth to hard bedrock	1.00	Depth to saturated zone	0.16
WcB—Wassaic silt loam, 3 to 8 percent slopes							
Wassaic	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.46	Depth to saturated zone	1.00	Slope	0.50
		Depth to saturated zone	0.16	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
						Depth to saturated zone	0.16

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Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcC—Wassaic silt loam, 8 to 15 percent slopes							
Wassaic	90	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to saturated zone	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
		Depth to saturated zone	0.16	Slope	0.63	Depth to saturated zone	0.16

Data Source Information

Soil Survey Area: Albany County, New York
 Survey Area Data: Version 10, Dec 19, 2011

Source - NRCS, 2011

Appendix C – Flora and Fauna Lists

Plant Species Likely to be Found in the Park	1
Animal Species Likely to be Found in the Park	6
Amphibians and Reptiles	6
Fish	7
Mammals.....	8
Birds.....	9

Plant Species Likely to be Found in the Park¹

(alphabetical by scientific name)

↔ Indicates that the species is listed as Threatened or Endangered in New York State

Acalypha rhomboidea Raf.	Allium vineale L.
Acalypha virginica L.	Alnus incana (L.) Moench
Acer nigrum Michx. f.	Alopecurus aequalis Sobol.
Acer pensylvanicum	Alopecurus pratensis L.
Acer spicatum Lam.	Amaranthus retroflexus
Achillea millefolium L.	Ambrosia artemisiifolia L.
Acorus americanus (Raf.) Raf.	Amelanchier arborea (Michx. f.) Fern.
Actaea pachypoda x spicata	Amphicarpaea bracteata (L.) Rickett & Stafleu
Actaea pachypoda Elliott	Anagallis arvensis L.
Actaea spicata L.	Anemonella thalictroides (L.) Spach
Adiantum pedatum L.	Antennaria plantaginifolia (L.) Richards.
Agrimonia gryposepala Wallr.	Anthoxanthum odoratum L.
Agrimonia rostellata	Aquilegia vulgaris L.
Agropyron trachycaulum (Link) Malte	Arabis canadensis L.
Agrostis perennans (L.) BSP.	Arabis divaricarpa A. Nelson
Agrostis scabra Willdenow	Arabis drummondii Gray
Alisma plantago-aquatica L.	Arabis glabra
Allium schoenoprasum L.	Arabis laevigata (Muhl.) Poir.
Allium tricoccum Ait.	Arabis lyrata L.

¹ This list and those that follow were taken from the Appendices of the *Helderberg Escarpment Planning Guide* (Driscoll and Childs, 2002). These lists are based on records in the New York State Museum databases. Although listed here as present in the Helderbergs the list is not specific to JB Thacher and Thompson's Lake State Parks. The Threatened and Endangered status of some of the species may have changed since these lists were developed

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Appendix C – Flora and Fauna Lists

Arctostaphylos uva-ursi (L.) Spreng.	Carex annectens (Bickn.) Bickn.
Arisaema dracontium (L.) Schott	Carex arctata Boott ex Hook.
Arisaema triphyllum (L.) Schott	↔ Carex aurea Nutt.
Asarum canadense L.	Carex bromoides Schkuhr ex Willd.
Asclepias incarnata L.	↔ Carex bushii Mackenzie
↔ Asclepias purpurascens	Carex canescens L.
Asclepias quadrifolia Jacq.	Carex cephaloidea (Dewey) Dewey
Asclepias syriaca L.	Carex cephalophora Muhl. ex Willd.
Asplenium ruta-muraria L.	Carex communis L.H. Bailey
Asplenium trichomanes L.	Carex comosa Boott
Aster acuminatus Michx.	Carex conoidea Schkuhr ex Willd.
Aster cordifolius L.	Carex crinita Lam.
Aster divaricatus L.	Carex cristatella Britton & Brown
Aster ericoides L.	Carex deweyana Schwein.
Aster lanceolatus Willdenow	Carex digitalis Willd.
Aster lateriflorus (L.) Britton	Carex disperma Dewey
Aster macrophyllus L.	Carex eburnea Boott
Aster novae-angliae L.	Carex flava L.
Aster puniceus L.	Carex gracilescens Steudel
Aster umbellatus	Carex gracillima Schwein.
Athyrium asplenoides	Carex granularis Muhl. ex Willd.
Athyrium thelypteroides (Michx.) Desv.	Carex grayi Carey
Atriplex patula	Carex hirsutella Mackenzie
Bassia scoparia	Carex hirtifolia Mackz.
Berberis thunbergii DC.	Carex hystericina Muhl. ex Willd.
Betula allegheniensis Britton	Carex interior Bailey
Betula cordifolia Rugel	Carex intumescens Rudge
Betula populifolia	Carex lacustris Willd.
Betula purpusii	Carex laxiculmis Schwein.
Bidens cernua L.	Carex laxiflora Lam.
Bidens connata Muhl. ex Willd.	Carex leptonevia (Fern.) Fern.
Bidens frondosa L.	↔ Carex lupuliformis Sartwell
Bidens tripartita L.	Carex lupulina Muhl. ex Willd.
Bidens vulgata Greene	Carex lurida Wahl.
Boehmeria cylindrica (L.) Sw.	Carex molesta Mackenzie
Botrychium matricariifolium (A.Br. ex Doll)	Carex normalis Mackz.
A.Br.	Carex pallescens L.
Brachyelytrum erectum (Schreb. ex Spreng.)	Carex pauciflora Lightf.
Poir.	Carex pedunculata Muhl. ex Willd.
Brachyelytrum septentrionale (Babel)	Carex pensylvanica Lam.
G.C.Tucker	Carex plantaginea Lam.
Bromus kalmii Gray	Carex platyphylla Carey
Bromus pubescens Muhl. ex Willd.	Carex prasina Wahl.
Brunnera macrophylla (Hook.) Johnst.	Carex radiata (Wahl.) Small
Bulbostylis capillaris (L.) C.B. Clarke	Carex retrorsa Schwein.
Calla palustris L.	Carex rosea Schkuhr ex Willd.
Callitriche heterophylla Pursh	Carex rugosperma Mackz.
Caltha palustris L.	Carex scabrata Schwein.
Campanula rapunculoides L.	Carex scoparia Schkuhr ex Willd.
Campanula rotundifolia L.	Carex sparganioides Muhl. ex Willd.
Camptosorus rhizophyllus (L.) Link	Carex spengelii Dewey
Capsella bursa-pastoris L.	Carex squarrosa L.
Cardamine pensylvanica Muhl. ex Willd.	Carex stipata Muhl.
Carex aenea Fern.	Carex stricta Lam.
Carex albursina Sheldon	Carex swanii (Fern.) Mackz.
Carex amphibola Steudel	Carex tenera Dewey

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<i>Carex torta</i> Boott ex Tuckerm.	<i>Cystopteris bulbifera</i> (L.) Bernh.
<i>Carex trisperma</i> Dewey	<i>Dactylis glomerata</i> L.
<i>Carex tuckermanii</i> Dewey	<i>Danthonia compressa</i> Austin
<i>Carex umbellata</i> Schkuhr ex Willd.	<i>Danthonia spicata</i> (L.) Beauv.
<i>Carex vulpinoidea</i>	<i>Daphne mezereum</i> L.
<i>Carpinus caroliniana</i> Walt.	<i>Dennstaedtia punctilobula</i> (Michx.) Moore
<i>Carum carvi</i> L.	<i>Desmodium glutinosum</i> (Muhlenberg) Wood
<i>Carya cordiformis</i> (Wang.) Koch	<i>Desmodium nudiflorum</i> (L.) DC.
<i>Carya glabra</i> (Mill.) Sweet	<i>Dianthus armeria</i> L.
<i>Carya ovata</i> (Mill.) Koch	<i>Diervilla lonicera</i> Mill.
<i>Castanea dentata</i> Borkh.	<i>Digitaria ischaemum</i> (Schreb.) Schreb.
<i>Castanea sativa</i> Mill.	<i>Digitaria sanguinalis</i> (L.) Scopoli
<i>Caulophyllum thalictroides</i> (L.) Michx.	<i>Diplachne acuminata</i> Nash
<i>Ceanothus americanus</i> L.	<i>Dirca palustris</i> L.
<i>Celastrus orbiculata</i> Thunb.	<i>Dryopteris carthusiana</i> (Vill.) Fuchs
<i>Celastrus scandens</i> L.	<i>Dryopteris clintoniana</i>
<i>Cerastium arvense</i> L.	<i>Dryopteris cristata</i>
<i>Cerastium fontanum</i> Baumg.	<i>Dryopteris hybrid</i> (see notes)
<i>Chamaedaphne calyculata</i> (L.) Moench	<i>Dryopteris intermedia</i> (Muhl.) Gray
<i>Chamaesyce maculata</i> (L.) Small	<i>Dryopteris marginalis</i> (L.) Gray
<i>Chelidonium majus</i> L.	<i>Dulichium arundinaceum</i> (L.) Britt.
<i>Chelone glabra</i> L.	<i>Echinochloa crus-galli</i> (L.) Beauv.
<i>Chenopodium glaucum</i> L.	<i>Echium vulgare</i> L.
<i>Chenopodium simplex</i>	<i>Eleocharis acicularis</i> (L.) R. & S.
<i>Chrysosplenium americanum</i> Schwein.	<i>Eleocharis elliptica</i>
<i>Cicuta bulbifera</i> L.	<i>Eleocharis erythropoda</i> Steudel
<i>Cicuta maculata</i> L.	<i>Eleocharis obtusa</i> (Willd.) Schultes
<i>Cinna arundinacea</i> L.	<i>Elymus hystrix</i> L.
<i>Circaea alpina</i> L.	<i>Elymus riparius</i> Wieg.
<i>Claytonia caroliniana</i> Michx.	<i>Elymus virginicus</i> L.
<i>Claytonia virginica</i> L.	<i>Epifagus virginiana</i>
<i>Clinopodium vulgare</i> L.	<i>Epilobium ciliatum</i> Raf.
<i>Clintonia borealis</i> (Ait.) Raf.	<i>Epilobium coloratum</i>
<i>Collinsonia canadensis</i> L.	<i>Epipactis helleborine</i> (L.) Crantz
<i>Conopholis americana</i> (L.f.) Wallr.	<i>Equisetum arvense</i> L.
<i>Corallorhiza maculata</i> (Raf.) Raf.	<i>Equisetum sylvaticum</i> L.
<i>Cornus alternifolia</i> L. f.	<i>Eragrostis hypnoides</i> (Lam.) BSP.
<i>Cornus amomum</i> Mill.	<i>Eragrostis reptans</i>
<i>Cornus canadensis</i> L.	<i>Eriocaulon aquaticum</i> (Hill) Druce
<i>Cornus florida</i> L.	<i>Eriophorum gracile</i> Roth
<i>Cornus foemina</i> Mill.	<i>Eriophorum tenellum</i> Nutt.
<i>Cornus paniculata</i>	<i>Eriophorum virginicum</i> L.
<i>Cornus sericea</i> L.	<i>Eriophorum viridicarinatum</i> (Engelm.) Fern.
<i>Corylus americana</i> Walt.	<i>Eupatorium fistulosum</i> Barratt
<i>Corylus cornuta</i> Marshall	<i>Eupatorium maculatum</i>
<i>Crataegus submollis</i> Sarg.	<i>Eupatorium perfoliatum</i> L.
<i>Cryptotaenia canadensis</i> (L.) DC.	<i>Eupatorium purpureum</i> L.
<i>Cuscuta gronovii</i> Willd. ex Schultz	<i>Eupatorium rugosum</i> Hoult.
<i>Cyperus bipartitus</i> Torr.	<i>Eupatorium serotinum</i> Michx.
→ <i>Cyperus erythrorhizos</i> Muhl.	<i>Euthamia graminifolia</i> (L.) Nutt. ex Cass.
<i>Cyperus esculentus</i> L.	<i>Fagus grandifolia</i>
<i>Cyperus lupulinus</i> (Spring.) Marcks	<i>Festuca subverticillata</i> Alexe'ev (F. obtusa)
<i>Cyperus squarrosus</i> L.	<i>Filipendula ulmaria</i> (L.) Maxim.
<i>Cyperus strigosus</i> L.	<i>Floerkea proserpinacoides</i> Willd.
<i>Cypripedium acaule</i> Ait.	<i>Fraxinus americana</i> L.
<i>Cypripedium parviflorum</i> Salisb.	<i>Fraxinus nigra</i> Marsh.

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<i>Galeopsis tetrahit</i> L.	<i>Lespedeza</i> sp.
<i>Galinsoga ciliata</i> (Raf.) Blake	<i>Lindera benzoin</i> (L.) Blume
<i>Galium lanceolatum</i> Torrey	<i>Lindernia dubia</i>
<i>Galium mollugo</i> L.	<i>Liparis lilifolia</i> (L.) Rich. ex Ker
<i>Galium triflorum</i>	<i>Liparis loeselii</i> L.
<i>Galium verum</i> L.	<i>Liriodendron tulipifera</i> L.
<i>Gaultheria hispidula</i> (L.) Muhl. ex Bigel.	<i>Lobelia cardinalis</i> L.
<i>Gaultheria procumbens</i>	<i>Lobelia inflata</i> L.
<i>Gaylussacia baccata</i> (Wang.) Koch	<i>Lobelia siphilitica</i> L.
<i>Gentianella quinquefolia</i> (L.) Small	<i>Lonicera canadensis</i> Bartr.
<i>Geranium maculatum</i> L.	<i>Lonicera diervilla</i>
<i>Geranium robertianum</i> L.	<i>Lonicera tatarica</i> L.
<i>Geum aleppicum</i> Jacq.	<i>Lunaria annua</i> L.
<i>Geum canadense</i> Jacq.	<i>Luzula acuminata</i> Raf.
<i>Geum virginianum</i>	<i>Luzula campestris</i>
<i>Glechoma hederacea</i> L.	<i>Lycopodium clavatum</i>
<i>Glyceria borealis</i> (Nash) Batch.	<i>Lycopodium dendroideum</i> Michx.
<i>Glyceria melicaria</i>	<i>Lycopodium digitatum</i> A.Br.
<i>Glyceria striata</i> (Lam.) Hitchc.	<i>Lycopodium hickeyi</i> Wagner Beitel & Moran
<i>Gnaphalium</i> sp.	<i>Lycopodium lucidulum</i> Michx.
<i>Gratiola neglecta</i> Torr.	<i>Lycopodium obscurum</i> L.
<i>Gymnocarpium dryopteris</i>	<i>Lycopus americanus</i> Muhl. ex Bart.
<i>Hackelia virginiana</i> (L.) Johnst.	<i>Lycopus rubellus</i> Moench
<i>Hamamelis virginiana</i> L.	<i>Lysimachia nummularia</i> L.
<i>Hedeoma pulegioides</i> (L.) Pers.	<i>Lysimachia punctata</i> L.
<i>Hedyotis longifolia</i> (Gaertn.) Hook.	<i>Lysimachia quadrifolia</i> L.
<i>Helenium autumnale</i>	<i>Lysimachia thyrsoiflora</i> L.
<i>Helianthus decapetalus</i> L.	<i>Maianthemum canadense</i> Desf.
<i>Helianthus divaricatus</i> L.	<i>Malus pumila</i> Mill.
<i>Hepatica nobilis</i> Mill.	<i>Malva neglecta</i> Wallr.
<i>Heteranthera dubia</i> (Jacquin) MacM.	<i>Matricaria matricarioides</i>
<i>Hieracium venosum</i> L.	<i>Medeola virginiana</i> L.
<i>Hierochloa odorata</i> (L.) Beauv.	<i>Menispermum canadense</i> L.
⇒ <i>Hybanthus concolor</i> (Forst.) Sprengel	<i>Mentha piperita</i>
<i>Hydrophyllum</i> sp.	<i>Mimulus ringens</i> L.
⇒ <i>Hypericum ascyron</i> L.	<i>Minuartia michauxii</i> (Fenzl) Farw.
<i>Hypericum mutilum</i> L.	<i>Mitchella repens</i> L.
<i>Ilex laevigata</i> (Torr.) Gray	<i>Mitella diphylla</i> L.
<i>Ilex verticillata</i> (L.) Gray	<i>Mitella nuda</i> L.
<i>Impatiens capensis</i> Meerb.	<i>Monarda fistulosa</i>
<i>Impatiens pallida</i> Nuttall	<i>Monotropa uniflora</i> L.
<i>Iris versicolor</i> L.	<i>Muhlenbergia frondosa</i> (Poir.) Fern.
<i>Juglans nigra</i> L.	<i>Muhlenbergia mexicana</i> (L.) Trin.
<i>Juncus secundus</i> Beauvois	<i>Muhlenbergia schreberi</i> Gmel.
<i>Juniperus communis</i> L.	<i>Muhlenbergia sobolifera</i>
<i>Juniperus virginiana</i> L.	<i>Myosotis laxa</i> Lehm.
<i>Kalmia angustifolia</i> L.	<i>Najas minor</i> All.
<i>Kalmia polifolia</i> Wang.	<i>Nemopanthus mucronatus</i> (L.) Loes.
<i>Lactuca canadensis</i> L.	<i>Nepeta cataria</i> L.
<i>Laportea canadensis</i>	<i>Oenothera perennis</i>
<i>Ledum groenlandicum</i> Oeder	<i>Orobanche uniflora</i> L.
<i>Leersia oryzoides</i> (L.) Sw.	<i>Oryzopsis asperifolia</i> Michx.
<i>Leersia virginica</i> Willd.	<i>Oryzopsis pungens</i> (Torr.) Hitchc.
<i>Lemna minor</i> L.	<i>Oryzopsis racemosa</i> (Sw.) Ricker ex Hitch
<i>Lemna trisulca</i> L.	<i>Osmorhiza claytonii</i> (Michaux) Clarke
<i>Lepidium campestre</i> (L.) R. Br.	<i>Osmorhiza longistylis</i> (Torrey) DC.

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<i>Osmunda cinnamomea</i> L.	<i>Ranunculus abortivus</i> L.
<i>Osmunda claytoniana</i> L.	<i>Ranunculus acris</i>
<i>Ostrya virginiana</i> (Mill.) Koch	<i>Ranunculus pensylvanicus</i> L. f.
<i>Oxalis fontana</i> Bunge	<i>Ranunculus recurvatus</i> Poir. ex Lam.
<i>Oxalis stricta</i>	<i>Ranunculus sceleratus</i> L.
<i>Panax quinquefolius</i> L.	<i>Rhamnus cathartica</i> L.
<i>Panicum acuminatum</i> Sw.	<i>Rhododendron maximum</i> L.
<i>Panicum gattingeri</i> Nash	<i>Rhododendron periclymenoides</i> (Michx.)
<i>Parietaria pensylvanica</i> Muhl. ex Willd.	Shinners
<i>Paronychia fastigiata</i> (Raf.) Fernald	<i>Ribes americanum</i> Mill.
<i>Parthenocissus vitacea</i>	<i>Ribes cynosbati</i> L.
<i>Pellaea atropurpurea</i> (L.) Link	<i>Robinia pseudo-acacia</i> L.
<i>Penstemon digitalis</i> Nuttall	<i>Rorippa sylvestris</i> (L.) Besser
<i>Penthorum sedoides</i> L.	<i>Rosa canina</i> L.
<i>Phragmites australis</i> (Cav.) Trin.	<i>Rosa carolina</i> L.
<i>Phryma leptostachya</i> L.	<i>Rosa multiflora</i>
<i>Picea mariana</i> (Mill.) BSP.	<i>Rubus allegheniensis</i> Porter
<i>Pilea fontana</i> (Lunell) Rydb.	<i>Rubus arundelanus</i> Blanchard
<i>Pilea pumila</i> (L.) Gray	<i>Rubus occidentalis</i>
<i>Pinus resinosa</i> Aiton	<i>Rubus odoratus</i> L.
<i>Pinus rigida</i> Mill.	<i>Rubus pubescens</i> Raf.
<i>Pinus strobus</i> L.	<i>Rudbeckia laciniata</i>
<i>Plantago rugelii</i> Dcne.	<i>Rudbeckia triloba</i> L.
<i>Platanthera grandiflora</i> (Bigel.) Lindl.	<i>Sagittaria rigida</i> Pursh
<i>Platanthera lacera</i> (Michx.) G. Don	<i>Salix bebbiana</i> Sarg.
<i>Poa alsodes</i> Gray	<i>Salix eriocephala</i> Michx.
<i>Poa compressa</i> L.	<i>Salix purpurea</i> L.
<i>Podophyllum peltatum</i> L.	<i>Sambucus americana</i>
<i>Polygala paucifolia</i> Willd.	<i>Sambucus racemosa</i> L.
<i>Polygala verticillata</i> L.	<i>Samolus valerandii</i> L.
<i>Polygonum amphibium</i> L.	<i>Sanguinaria canadensis</i> L.
<i>Polygonum arifolium</i> L.	<i>Sanicula canadensis</i> L.
<i>Polygonum cespitosum</i> Blume	<i>Sanicula gregaria</i> Bickn.
<i>Polygonum hydropiper</i> L.	<i>Sanicula trifoliata</i> Bickn.
<i>Polygonum hydropiperoides</i> Michx.	<i>Sarracenia purpurea</i> L.
<i>Polygonum lapathifolium</i> L.	<i>Saxifraga americana</i> Schw.
<i>Polygonum punctatum</i> Ell.	<i>Saxifraga pensylvanica</i> L.
<i>Polygonum sagittatum</i> L.	<i>Saxifraga virginiana</i> Michx.
→ <i>Polygonum tenue</i> Michx.	<i>Schizachne purpurascens</i> (Torrey) Swallen
<i>Polygonum virginianum</i> L.	<i>Schizachyrium scoparium</i> (Michx.) Nash
<i>Polystichum acrostichoides</i> (Michx.) Schott	<i>Scirpus acutus</i> Muhl. ex Bigel.
<i>Portulaca oleracea</i>	<i>Scirpus atrocinctus</i> Fern.
<i>Potamogeton crispus</i> L.	<i>Scirpus atrovirens</i> Willd.
<i>Potamogeton epihydrus</i> Raf.	<i>Scirpus cyperinus</i> (L.) Kunth.
<i>Potamogeton natans</i>	↔ <i>Scirpus georgianus</i> Harper
<i>Potamogeton nodosus</i> Poiret	<i>Scirpus hattorianus</i> Makino
<i>Potentilla argentea</i> L.	<i>Scirpus hybrid</i>
<i>Prenanthes altissima</i> L.	<i>Scirpus pedicellatus</i> Fern.
<i>Prunella vulgaris</i> L.	<i>Scirpus pendulus</i> Muhl.
<i>Prunus serotina</i> Ehrh.	<i>Scirpus tabernaemontanii</i> Gmel.
<i>Prunus virginiana</i> L.	<i>Scirpus verecundus</i> Fern.
<i>Pycnanthemum tenuifolium</i> Schrad.	<i>Scleranthus annuus</i> L.
<i>Quercus alba</i> L.	<i>Scrophularia marilandica</i> L.
<i>Quercus ilicifolia</i> Wang.	<i>Scutellaria galericulata</i> L.
<i>Quercus macrocarpa</i> Michx.	<i>Scutellaria lateriflora</i> L.
<i>Quercus rubra</i> L.	<i>Sedum acre</i> L.

Animal Species Likely to be Found in the Park

AMPHIBIANS AND REPTILES:

Amphibians and reptiles reported from the Helderberg Escarpment and adjacent areas, Albany County, New York, 1993. Information from New York State Museum files and catalogues, based on museum collections and historic reports. Abundance ratings from Douglas Fraser (1993), Siena College. Additional information from Alvin Breisch (1993). Reports of other species exist but either have not been verified or are more than 50 years old. Codes: SC=species of special concern, R=rare, C=common, F=forest, A=residential areas, M=meadows or fields, W=wetlands, L=lentic (standing water), S=stream (running water).

Species	Status	Relative Abundance	Dominant Habitat
Jefferson salamander, <u>Ambystoma jeffersonianum</u>	SC	R	W
Jefferson s. complex, <u>Ambystoma jeffersonianum x laterale</u>		C	W
Blue-spotted salamander, <u>Ambystoma laterale</u>	SC	R	W
Blue-spotted s. complex, <u>Ambystoma laterale x jeffersonianum</u>		C	W
Spotted salamander, <u>Ambystoma maculatum</u>	SC	C	W
Red-spotted newt, <u>Notophthalmus v. vividescens</u>		C	W,L,S
Northern spring salamander, <u>Gyrinophilus p. parphyriticus</u>		R	S
Northern dusky salamander, <u>Desmognathus fuscus</u>		C	W,S
Allegheny mtn. dusky salamander, <u>Desmognathus ochrophaeus</u>		R	W,S
Four-toed salamander, <u>Hemidactylium scutatum</u>		R	W
Northern redback salamander, <u>Plethodon cinereus</u>		C	F,W
Northern slimy salamander, <u>Plethodon glutinosus</u>		R	F,W
Northern red salamander, <u>Pseudotriton r. ruben</u>		R	F,M,W,S
Northern two-lined salamander, <u>Eurycea bislineata</u>		C	W,S
Eastern American toad, <u>Bufo a. americanus</u>		C	F,M,A
Northern spring peeper, <u>Pseudacris crucifer</u>		C	W
Gray treefrog, <u>Hyla versicolor</u>		C	F,L
American bullfrog, <u>Rana catesbeiana</u>		C	L,S,W
Green frog, <u>Rana clamitans melanota</u>		C	S,L,F
Wood frog, <u>Rana sylvatica</u>		C	F,M,W,L
Pickerel frog, <u>Rana palustris</u>		C	S,M,L,W
Northern leopard frog, <u>Rana pipiens</u>		R	M,L,S,W
Northern water snake, <u>Nerodia s. sipedon</u>		R	S,L,W
Northern brown snake, <u>Storeria dekayi</u>		C	W,M,A
Northern redbelly snake, <u>Storeria o. occipitomaculata</u>		R	F,W, M
Common garter snake, <u>Thamnophis sirtalis</u>		C	F,A,M,W
Eastern ribbon snake, <u>Thamnophis sauritus</u>		R	W,M,L
Eastern hognose snake, <u>Heterodon platirhinos</u>	SC	R	F,M
Northern ringneck snake, <u>Diadophis punctatus edwardsii</u>		C	F,W
Smooth green snake, <u>Liochlorophis vernalis</u>		R	M,W
Eastern milk snake, <u>Lampropeltis t. triangulum</u>		C	A,F,M

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Species	Status	Relative Abundance	Dominant Habitat
Common snapping turtle, <u>Chelydria serpentina</u>		C	L,W,S
Wood turtle, <u>Clemmys insculpta</u>	SC	R	M,F,S
Eastern box turtle, <u>Terrapene c. carolina</u>		R	W
Painted turtle, <u>Chrysemys picta</u>		C	L,S,W

FISH:

Fishes reported from the Helderberg Escarpment and adjacent areas, Albany County, New York, 1993. Information from New York State Museum files and catalogues, based on museum collections and historic reports. Codes: I=introduced, G=game fish, R=rare, C=common, A=abundant, P=pond, S=stream

Species	Status	Relative Abundance	Dominant Habitat
Brown bullhead, <u>Ameiurus nebulosus</u>	G	A	P
White sucker, <u>Catostomus commersoni</u>		A	S, P
Central stoneroller, <u>Campostoma anomolum</u>		R	S
Redside dace, <u>Clinostomus elongatus</u>		R	S
Cutlips minnow, <u>Exoglossum maxillingua</u>		R	S
Brassy minnow, <u>Hybognathus hankinsoni</u>		R	S
Common shiner, <u>Luxilus cornutus</u>		C	S, P
Pearl dace, <u>Margariscus margarita</u>		R	S
Golden shiner, <u>Notemigonus crysoleucas</u>		A	P
Rosyface shiner, <u>Notropis rubellus</u>		R	S
Northern redbelly dace, <u>Phoxinus eos</u>		R	Marsh
Bluntnose minnow, <u>Pimephales notatus</u>		C	S
Fathead minnow, <u>Pimephales promelas</u>		R	P, S
Blacknose dace, <u>Rhinichthys atratulus</u>		A	S
Longnose dace, <u>Rhinichthys cataractae</u>		C	S
Creek chub, <u>Semotilus atromaculatus</u>		A	S, P
Chain pickerel, <u>Esox niger</u>	G	C	P
Rainbow trout, <u>Oncorhynchus mykiss</u>	I, G	C	P,S
Central mudminnow, <u>Umbra limi</u>		R	S, P
Banded killifish, <u>Fundulus diaphanus</u>		C	P, S
Brook stickleback, <u>Culaea inconstans</u>		R	Marsh
Slimy sculpin, <u>Cottus cognatus</u>		R	S
Rock bass, <u>Ambloplites rupestris</u>	G	C	P
Pumpkinseed, <u>Lepomis gibbosus</u>	G	A	P
Bluegill, <u>Lepomis maculatus</u>	G	C	P
Smallmouth bass, <u>Micropterus dolomieu</u>	G	C	P, S
Largemouth bass, <u>Micropterus salmoides</u>	G	R	P, S
Fantail darter, <u>Etheostoma flabellare</u>		R	S
Tesselated darter, <u>Etheostoma olmstedii</u>		C	S, P
Yellow perch, <u>Perca flavescens</u>	G	A	P, S

MAMMALS:

Mammals reported from the Helderberg Escarpment and adjacent areas, Albany County, New York, 1993. Information from New York State Museum files and catalogs, based on museum collections and historic reports. Codes: E=endangered, SC=species of special concern, F=forest, N=non-forest, W=wetland, A=aerial

Species	Status	Dominant Habitat
Virginia opossum, <u>Didelphis virginiana</u>		F, N
Masked shrew, <u>Sorex cinereus</u>		F, N
Smokey shrew, <u>Sorex fumeus</u>		F
Northern short-tailed shrew, <u>Blarina brevicauda</u>		F, N, W
Hairy-tailed mole, <u>Parascalops breweri</u>		F, N
Star-nosed mole, <u>Condylura cristata</u>		N, W
Northern long-eared bat, <u>Myotis septentrionalis</u>		A
Eastern small-footed bat, <u>Myotis leibii</u>	SC	A
Little brown bat, <u>Myotis lucifugus</u>		A
Indiana myotis, <u>Myotis sodalis</u>	E	A
Red bat, <u>Lasiurus borealis</u>		A
Hoary bat, <u>Lasiurus cinereus</u>		A
Eastern pipistrelle, <u>Pipistrellus subflavus</u>		A
Big brown bat, <u>Eptesicus fuscus</u>		A
Eastern cottontail, <u>Sylvilagus floridanus</u>		F, N
Snowshoe hare, <u>Lepus americanus</u>		F
Eastern chipmunk, <u>Tamias striatus</u>		F, N
Woodchuck, <u>Marmota monax</u>		N
Gray squirrel, <u>Sciurus carolinensis</u>		F
Red squirrel, <u>Tamiasciurus hudsonicus</u>		F
Northern flying squirrel, <u>Glaucomys sabrinus</u>		F
Southern flying squirrel, <u>Glaucomys volans</u>		F
Beaver, <u>Castor canadensis</u>		W
White-footed mouse, <u>Peromyscus leucopus</u>		F, N
Deer mouse, <u>Peromyscus maniculatus</u>		F, N
Southern red-backed vole, <u>Clethrionomys gapperi</u>		F
Meadow vole, <u>Microtus pennsylvanicus</u>		N, W
Muskrat, <u>Ondatra zibethicus</u>		W
Southern bog lemming, <u>Synaptomys cooperi</u>		F, N, W
Norway rat, <u>Rattus norvegicus</u>		N
House mouse, <u>Mus musculus</u>		N
Meadow jumping mouse, <u>Zapus hudsonius</u>		N, W
Woodland jumping mouse, <u>Napaeozapus insignis</u>		F
Porcupine, <u>Erethizon dorsatum</u>		F
Coyote, <u>Canis latrans</u>		F, N
Red fox, <u>Vulpes vulpes</u>		F, N
Gray fox, <u>Urocyon cinereoargenteus</u>		F, N
Black bear, <u>Ursus americanus</u>		F, W
Raccoon, <u>Procyon lotor</u>		F, N, W
Fisher, <u>Martes pennanti</u>		F
Ermine, <u>Mustela erminea</u>		F
Long-tailed weasel, <u>Mustela frenata</u>		F, N
Mink, <u>Mustela vison</u>		F, W
Striped skunk, <u>Mephitis mephitis</u>		F, N, W
River otter, <u>Lontra canadensis</u>		W
Bobcat, <u>Felis rufus</u>		F
White-tailed deer, <u>Odocoileus virginianus</u>		F, N, W

BIRDS:

Birds reported from the Helderberg Escarpment and adjacent areas, Albany County, New York, 1993. Information from New York State Museum files and catalogs, based on museum collections and historic reports. Codes: E=endangered, T=threatened, SC=species of special concern, M=migrant, S=summer resident or permanent nesting species, F=forest, N=non-forest, W=wetland.

Species	Status	Residency	Dominant Habitat
Common loon, <u>Gavia immer</u>	SC	M	W
Horned grebe, <u>Podiceps auritus</u>		M	W
Pied-billed grebe, <u>Podilymbus podiceps</u>	T	M, S	W
Double-crested cormorant, <u>Phalacrocorax auritus</u>		M	W
Great blue heron, <u>Ardea herodias</u>		M, S	W
Great egret, <u>Casmerodius albus</u>		M	W
Green heron, <u>Butorides striatus</u>		M, S	W
American bittern, <u>Botaurus lentiginosus</u>	SC	M, S	W
Whistling swan, <u>Olor columbianus</u>		M	W
Canada goose, <u>Branta canadensis</u>		M, S	W
Snow goose, <u>Chen caerulescens</u>		M	W
Wood duck, <u>Aix sponsa</u>		M, S	W
Mallard duck, <u>Anas platyrhynchos</u>		M, S	W
American black duck, <u>Anas rubripes</u>		M, S	W
Gadwall, <u>Anas strepera</u>		M	W
Common pintail, <u>Anas acuta</u>		M	W
American wigeon, <u>Anas americana</u>		M	W
Green-winged teal, <u>Anas crecca</u>		M	W
Blue-winged teal, <u>Anas discors</u>		M, S	W
Northern shoveler, <u>Anas clypeata</u>		M	W
Ring-necked duck, <u>Aythya collaris</u>		M	W
Lesser scaup, <u>Aythya affinis</u>		M	W
Oldsquaw, <u>Clangula hyemalis</u>		M	W
White-winged scoter, <u>Melanitta deglandi</u>		M	W
Surf scoter, <u>Melanitta perspicillata</u>		M	W
Bufflehead, <u>Bucephala albeola</u>		M	W
Common goldeneye, <u>Bucephala clangula</u>		M	W
Hooded merganser, <u>Lophodytes cucullatus</u>		M, S	W
Common merganser, <u>Mergus merganser</u>		M	W
Red-breasted merganser, <u>Mergus serrator</u>		M	W
Ruddy duck, <u>Oxyura jamaicensis</u>		M	W
Turkey vulture, <u>Cathartes aura</u>		M	F, N
Osprey, <u>Pandion haliaetus</u>	SC	M, S	W
Bald eagle, <u>Haliaetus leucocephalus</u>	T	M	W
Northern harrier, <u>Circus cyaneus</u>	T	M	N
Sharp-shinned hawk, <u>Accipiter striatus</u>	SC	M, S	F
Northern goshawk, <u>Accipiter gentilis</u>	SC	M, S	F
Red-tailed hawk, <u>Buteo jamaicensis</u>		M, S	F, N
Red-shouldered hawk, <u>Buteo lineatus</u>	SC	M, S	F

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Species	Status	Residency	Dominant Habitat
Broad-winged hawk, <u>Buteo platypterus</u>		M, S	F
Rough-legged hawk, <u>Buteo lagopus</u>		M	N
Peregrine falcon, <u>Falco peregrinus</u>	E	M	N
Merlin, <u>Falco columbarius</u>		M	N
American kestrel, <u>Falco sparverius</u>		M, S	N
Ring-necked pheasant, <u>Phasianus colchicus</u>		S	N
Ruffed grouse, <u>Bonasa umbellus</u>		S	F
Wild turkey, <u>Meleagris gallopavo</u>		S	F, N
Virginia rail, <u>Rallus limicola</u>		M, S	W
Sora rail, <u>Porzana carolina</u>		M, S	W
Common gallinule, <u>Gallinula chloropus</u>		M, S	W
American coot, <u>Fulica americana</u>		M	W
Semipalmated plover, <u>Gharadrius semipalmatus</u>		M	W
Killdeer, <u>Charadrius vociferus</u>		M, S	N, W
American woodcock, <u>Philohela minor</u>		M, S	F, N, W
Common snipe, <u>Capella gallinago</u>		M	N, W
Greater yellowlegs, <u>Tringa melanoleuca</u>		M	W
Lesser yellowlegs, <u>Tringa flavipes</u>		M	W
Solitary sandpiper, <u>Tringa solitaria</u>		M	W
Spotted sandpiper, <u>Acititis macularia</u>		M	W
Pectoral sandpiper, <u>Calidris melanotos</u>		M	W
Great black-backed gull, <u>Larus marinus</u>		M	N, W
Herring gull, <u>Larus argentatus</u>		M	N, W
Ring-billed gull, <u>Larus delawarensis</u>		M	N, W
Bonaparte's gull, <u>Larus philadelphia</u>		M	N, W
Black tern, <u>Chlidonias niger</u>	E	M	W
Rock dove, <u>Columba livia</u>		S	N
Mourning dove, <u>Zenaida macroura</u>		M, S	F, N
Yellow-billed cuckoo, <u>Coccyzus americanus</u>		M, S	F
Black-billed cuckoo, <u>Coccyzus erythrophthalmus</u>		M, S	F
Barn owl, <u>Tyto alba</u>		S	F, N
Common screech owl, <u>Otus asio</u>		S	F, N
Great horned owl, <u>Buto virginianus</u>		S	F, N
Snowy owl, <u>Nyctea scandiaca</u>		M	N
Barred owl, <u>Strix varia</u>		S	F
Long-eared owl, <u>Asio otus</u>		M	F
Short-eared owl, <u>Asio flammeus</u>	E	M	N
Saw-whet owl, <u>Aegolius acadicus</u>		M	F
Whip-poor-will, <u>Caprimulgus vociferus</u>	SC	M, S	F
Common nighthawk, <u>Chordeiles minor</u>	SC	M, S	N
Chimney swift, <u>Chaetura pelagica</u>		M, S	N
Ruby-throated hummingbird, <u>Archilochus colubris</u>		M, S	F, N
Belted kingfisher, <u>Megaceryl alcyon</u>		M, S	W
Common flicker, <u>Colaptes auratus</u>		M, S	F, N
Pileated woodpecker, <u>Dryocopus pileatus</u>		S	F
Red-bellied woodpecker, <u>Melanerpes carolinus</u>		M, S	F
Hairy woodpecker, <u>Picoides villosus</u>		S	F
Downy woodpecker, <u>Picoides pubescens</u>		S	F, N
Eastern kingbird, <u>Tyrannus tyrannus</u>		M, S	N
Great crested flycatcher, <u>Myiarchus crinitus</u>		M, S	N, W
Yellow-bellied flycatcher, <u>Empidonax flaviventris</u>		M	F
Acadian flycatcher, <u>Empidonax virescens</u>		M, S	F, W

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Species	Status	Residency	Dominant Habitat
Nashville warbler, <u>Vermivora ruficapilla</u>		M	F
Northern parula warbler, <u>Parula americana</u>		M, S	F
Yellow warbler, <u>Dendroica petechia</u>		M, S	F, N, W
Magnolia warbler, <u>Dendroica magnolia</u>		M, S	F
Cape May warbler, <u>Dendroica tigrina</u>		M	F
Black-throated blue warbler, <u>Dendroica caerulescens</u>		M, S	F
Yellow-rumped warbler, <u>Dendroica coronata</u>		M, S	F
Black-throated green warbler, <u>Dendroica virens</u>		M, S	F
Blackburnian warbler, <u>Dendroica fusca</u>		M, S	F
Chestnut-sided warbler, <u>Dendroica pensylvanica</u>		M, S	F
Bay-breasted warbler, <u>Dendroica castanea</u>		M	F
Blackpoll warbler, <u>Dendroica striata</u>		M	F
Pine warbler, <u>Dendroica pinus</u>		M, S	F
Prairie warbler, <u>Dendroica discolor</u>		M, S	N
Palm warbler, <u>Dendroica palmarum</u>		M	N
Ovenbird, <u>Seiurus aurocapillus</u>		M, S	F
Northern waterthrush, <u>Seiurus noveboracensis</u>		M, S	W
Louisiana waterthrush, <u>Seiurus motacilla</u>		M, S	F, W
Mourning warbler, <u>Oporornis philadelphia</u>		M	F
Common yellowthroat, <u>Geothlypis trichas</u>		M, S	N, W
Wilson's warbler, <u>Wilsonia pusilla</u>		M	N
Canada warbler, <u>Wilsonia canadensis</u>		M, S	F
American redstart, <u>Setophaga ruticilla</u>		M, S	F
Bobolink, <u>Dolichonyx oryzivorus</u>		M, S	N
Eastern meadowlark, <u>Sturnella magna</u>		M, S	N
Red-winged blackbird, <u>Agelaius phoeniceus</u>		M, S	N, W
Orchard oriole, <u>Icterus spurius</u>		M, S	F
Northern oriole, <u>Icterus galbula</u>		M, S	F
Rusty blackbird, <u>Euphagus carolinus</u>		M	W
Common grackle, <u>Quiscalus quiscula</u>		M, S	N, W
Brown-headed cowbird, <u>Molothrus ater</u>		M, S	F, N
European starling, <u>Sturnus vulgaris</u>		S	F, N
House sparrow, <u>Passer domesticus</u>		S	N
Scarlet tanager, <u>Piranga olivacea</u>		M, S	F
Northern cardinal, <u>Cardinalis cardinalis</u>		S	F, N
Rose-breasted grosbeak, <u>Phœucticus ludovicianus</u>		M, S	F
Indigo bunting, <u>Passerina cyanea</u>		M, S	F, N
Evening grosbeak, <u>Hesperiphona vespertina</u>		M	F, N
Purple finch, <u>Carpodacus purpureus</u>		M, S	F, N
Pine grosbeak, <u>Pinicola enucleator</u>		M	F, N
Common redpoll, <u>Carduelis flammea</u>		M	N
American goldfinch, <u>Carduelis tristis</u>		S	F, N
Pine siskin, <u>Carduelis pinus</u>		M	F, N
Red crossbill, <u>Loxia curvirostra</u>		M	F
White-winged crossbill, <u>Loxia leucoptera</u>		M	F
Rufous-sided towhee, <u>Pipilo erythrophthalmus</u>		M, S	F, N
Savannah sparrow, <u>Passerculus sandwichensis</u>		M, S	N
Henslow's sparrow, <u>Ammodramus henslowii</u>	T	M, S	N
Grasshopper sparrow, <u>Ammodramus savannarum</u>	SC	M, S	N
Vesper sparrow, <u>Poœcetes gramineus</u>	SC	M, S	N
American tree sparrow, <u>Spizella arborea</u>		M	F, N

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Species	Status	Residency	Dominant Habitat
Chipping sparrow, <u>Spizella passerina</u>		M, S	F, N
Field sparrow, <u>Spizella pusilla</u>		M, S	N
Northern junco, <u>Junco hyemalis</u>		M, S	F, N
White-crowned sparrow, <u>Zonotrichia leucophrys</u>		M	F, N
White-throated sparrow, <u>Zonotrichia albicollis</u>		M, S	F, N
Fox sparrow, <u>Passerella iliaca</u>		M	F, N
Lincoln's sparrow, <u>Melospiza lincolni</u>		M	F, N
Swamp sparrow, <u>Melospiza georgiana</u>		M, S	W
Song sparrow, <u>Melospiza melodia</u>		M, S	N, W
Lapland longspur, <u>Calcarius lapponicus</u>		M	N
Snow bunting, <u>Plectrophenax nivalis</u>		M	N

Appendix D - Cultural Resources and Park History

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John Boyd Thacher State Park

Archaeology

Old farm maps as well as various publications, show and talk about the existence of several houses and structures that once stood within the current property boundary lines of Thacher Park. There appears to be no previous survey data on any of these structures. However, there is evidence of structures and houses that were part of the farms atop the escarpment that the Park eventually acquired. These locations include the Glen Doone and Greenhouse areas as well as structures adjacent to Beaver Dam Road on the south side of the park.

Geology

The area that we now call Thacher Park has a rich history and is renowned worldwide for its geology. Thacher Park sits atop the Helderberg Escarpment, a fossil rich limestone cliff that shows the evidence of an ancient sea that covered much of New York hundreds of millions of years ago. The shells of sea animals were the source of the limestone, and many were preserved as fossils. Over time, the landscape changed dramatically as land masses collided, mountains were built, and the sea drained away. Ultimately the land rose and the limestone was exposed by erosion. Streams cut through the resistant limestone layers to the softer shale layers below. The shale eroded and undermined the limestone. Large blocks of limestone fell away along vertical cracks called joints, forming the escarpment. The rocks of the great cliffs are a solid blue limestone of the Silurian age, while the slopes above are overlying strata of the Devonian age. The American Scenic and Historic Preservation Society called the area geologist's paradise because of its importance in the study of the earth's formation. Over the years the area has attracted scientists as prominent as Sir Charles Lyell, founder of modern geology. Lyell once remarked in the 1840's "The Helderbergs are the key to the geology of North America". In November of 1933, a bronze memorial plaque was presented to the park by a local chapter of the Daughters of the American Revolution to honor 17 early geologist's who studied the formations around the Helderberg Escarpment.

Early History

Long before Europeans arrived on the continent, Native Americans were traveling from the western hills of the Schoharie Valley to the Hudson River Valley by way of footpaths. When they reached the Helderberg Escarpment, they felled tall trees against the cliff and trimmed back the branches for easy climbing. Early settlers called these trees Indian ladders, and later the trail was called the Indian Ladder Trail. The Indian Ladder Trail remains a popular attraction at the park today. When walking this trail, visitors ponder the massive cliffs overhead and when swollen by the rains, are awe inspired by the impressive waterfalls. The western end of the trail formed the beginning of what became the Indian Ladder Road, connecting the valley with the top of the cliff.

After the Revolutionary War, the settlers in the farming country contiguous to the Helderbergs occupied land originally forming part of the extensive Rensselaer Manor property. Stephen Van Rensselaer III advertised "free" tracts of land of 160 acres to anyone who would develop the land. (After seven years farmers had to pay an annual rent of four fat fowls, 18 bushels of wheat and a day's service. The rents were perpetual and binding on subsequent purchasers of the land and the patroon reserved mineral and water rights. These "incomplete sales" led to the Anti-Rent Wars of the Helderbergs and to the Anti-Rent Rebellion 1839-1889, which influenced the wording of the Federal Homestead Act of 1862 and opened up the west to settlement.)

Park Development

In 1914 Emma Treadwell Thacher gave the State of New York 350 acres along the Helderberg Escarpment which became John Boyd Thacher State Park, in memory of her husband. The official dedication and opening of the park was held on September 14, 1914 and was attended by nearly 2000 people including Governor Martin H. Glynn. John Boyd Thacher was a two time mayor of Albany and a State senator. He was also a historian, conservationist, collector of Indian artifacts and a collector of autographs and books. In 1906, he began acquiring some of the property along the scenic Helderberg escarpment to preserve its natural beauty from the intrusion of commercial development. This is the land that Emma Treadwell Thacher donated to the State of New York.

In 1915, at the suggestion of Emma Thacher, John H. Cook was named the first Superintendent of the Thacher Park. Cook was a surveyor and a geologist whose abilities were useful in laying out roads and mapping the park in its formative years.

A piece of granite was placed at the base of a birch tree where the dedication ceremony took place and a United States Geological survey bench mark was affixed to the stone. The location was named Thacher Point.

In 1920, Mrs. Thacher added an additional 50 acres along the west shore of Thompson's Lake. In her deed, Mrs. Thacher stipulated that the Albany Boys Club would continue to have use of 10 acres for their summer camp, Camp Thacher. Part of this 10 acres is where the Emma Treadwell Thacher Nature Center is now located.

In the 1920's many improvements were made to the park and several additional land parcels were acquired. During the 1920's several appropriation bills were signed by Governor Alfred E. Smith providing funding for the development of infrastructure, picnic areas, parking lots, fences and ladders for access to the Indian Ladder Trail.

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Throughout the 1920's and 1930's, many additional parcels adjacent to the original 350 acres were purchased by the State and added to the park. Thacher Park Road (State Route 157) was soon constructed and now put the park within easy access of Albany by automobile.

The names of different areas in the park call attention to its history. The Greenhouse area recognizes an early farmhouse that was painted green and once located on site. Yellow Rocks commemorates a major rock fall in the 1830's when a large portion of the cliff face tumbled down the talus slope, revealing a new, bright yellow limestone exposure. Hop Field and Pear Orchard recall the early farming community along the top of the escarpment. Glen Doone was named after a remote valley with cliffs on England's southern coast. Knowles Flat honors Scott Knowles, the second superintendent of the park, known as the "Grand Old Host of the Helderbergs". LaGrange Bush, known earlier as LaGrange woods, notes the LaGrange family's settlement there. Minelot and Paint Mine call attention to an earlier time when Indians and colonists dug for limestone and pyrite at these sites. The pyrite was used in the production of paint. The Indian Ladder lot marks the location of the legendary ladder used by the Indians. The Horseshoe area represents a large area of the cliff that projects outward to the valley in the shape of a horseshoe between Indian Ladder gulf and cave gulf. The Hailes Cave area is named for the cave below the cliff in that honors Professor Theodore C. Hailes, and instructor at the old Albany High School and a persistent explorer.

In 1939, Thacher Park, including the Thompson's Lake portion, was transferred from the jurisdiction of the American Scenic and Historic Preservation Society to the Division of Lands and Forests of the New York State Conservation Department. Application was also made to the National Park Service for the establishment of a Civilian Conservation Corps (CCC) camp in the Thompson's Lake portion of the park. The CCC camp, Project No. SP-43, Company 236, was established on September 16, 1940. The CCC camp at Thompson's Lake provided the labor needed to install a new 4-inch water main in Thacher Park in 1941. Progress was also made with the parking area for the overlook at the Escarpment and in the construction of new park service buildings, but, like other CCC camps in the State, this CCC camp suffered from low enrollment and results of the work program were below expectations. The overlook parking area was completed by the Conservation Department in 1942, but the CCC camp was abandoned at the beginning of the year, soon after the attack on Pearl Harbor and the beginning of the war. Because of the short service life of the camp, little of the development and rehabilitation program planned for Thacher Park was accomplished.

A bathhouse and swimming pool were constructed in 1953. The bathhouse cost \$150,000 and the pool another \$293,800. Conservation Department Commissioner, Perry Duryea spoke of the state-owned park and remarked on the urgency of the project "because of the shortage of swimming facilities in the Capital Region." The pool opened in 1954 and park attendance nearly doubled. The pool thrived for many years but eventually came to the end of its life span in 2006. Over the years, the combination of nearby towns and cities adding public swimming pools as well as the popularity of backyard pools caused a steady decline in attendance. At the same time, maintenance issues grew to a point where, in the interest of public safety, the pool had to be closed. The bathhouse was demolished in 2008.

Although the pool was in decline, it did not stop the park from expanding. During the 1990's, in a collaborative effort with the Open Space Institute and the Nature Conservancy, State Parks sought to safeguard nearly 1000 acres along the top of the escarpment. In 2004, acquisitions totaling 586 acres were added to Thacher Park.

Finally, in 2006 a 188 acre lot atop the escarpment, bordered on the west by Old Stage Road, was purchased. This was a key acquisition in the State's efforts to protect the escarpment from development. The acquisition included "High Point", reported to be the highest elevation along the escarpment, and brought the total park acreage up to 2155 acres.

Tory Cave

During the American Revolution, a Tory (British Loyalist) hid in a nearby cave and led raids on patriot farms in the valley below. He was discovered when the smoke from his campfire rose through the fractured limestone and led his captors to what became known as the Tory Cave. The cave became a popular destination for tourists who climbed up the cliff to the secret hideout perched above the Indian Ladder Road. Due to the safety concerns of modern day patrons climbing up to this cave, it has not been accessible to the public for many years.

Thompson's Lake State Park

Archaeology

The archeology and history of Thompson's Lake is of special interest because of its isolated location above the Helderberg escarpment. It was a place where prehistoric people as early perhaps 6000 B.C. camped, fished, and repaired tools for brief periods during hunting trips from base camps or villages located in lower valleys. In 1922 an archeologist with the NYS Museum reported that the site of a small camp on Thompson's Lake had been found, probably near the north end of the lake. He also reported that there is said to have been a cave nearby at the entrance of which Indian relics and a large carved tablet were found. Archeological testing for a new water line in the park in 1985 revealed no evidence of prehistoric occupation. However, in 1999, archeological testing for the proposed Nature Center at Thompson's Lake confirmed the existence of a site at the northwest corner of the lake. The testing revealed two fire-cracked rocks, five flint chips, a fragment of a worked flint bifacial blade, and a piece of a flint core. No dateable or culturally diagnostic artifacts were found, nor was there any feature with charcoal or other material that could provide a date of occupation.

Early History

Thompson's Lake had been explored by New York colonists and was located on maps by the mid-18th century. Historians in the 19th century recorded that Thompson's Lake was named for John and William Thompson. John and William Thompson likely settled in the area, probably as early as 1770, and probably came from Marblehead, Massachusetts. The identities of John and William Thompson remain unclear, however, several census reports indicate occupancy of various land lots in the Thompson's Lake vicinity can be traced to the Thompson's or a descendant of theirs. The subsequent history of Thompson's Lake is characterized by the tremendous influx of Connecticut settlers following the Revolutionary War, the lease of farms from Stephen van Rensselaer. The lands surrounding Thompson's Lake were primarily farms; some of which are now part of the park. Starting in the 1870's, Thompson's Lake was undergoing a transformation and property values were increasing. An article in the Harper's New Monthly Magazine promoted the "varied landscape and accessible grandeur" of the Helderbergs. During the 1880's Thompson's Lake was becoming a summer resort destination for which ample accommodations were available. The Lake View House was located on the west side of present Route 157 near the southwest corner of Thompson's Lake. Shortly after, a second hotel, the

Grove Hotel, was built across the road to the east and south. Both properties were sold and remodeled a couple of times as tourism flourished in the Helderbergs. Many local farmers even converted their houses into boarding houses to accommodate the demand for summer getaways. The development of the automobile contributed to the decline of tourism at the Thompson's Lake hotels. Tourists, no longer confined to locations readily accessible by rail and stage, were now free to carry their dollar to other venues. Furthermore, the Great Depression certainly hurt both the small boarding houses as well as the larger hotels. The owners of both hotels ended up owing delinquent taxes.

Park Development

Construction plans were drawn up in 1960 and the campground first opened to the public in 1963. A portion of the campground was built the original 50 acres of land donated by Emma Treadwell Thacher in 1920.

In 1987, 4 lots adjacent to Stan Levine Drive (currently Nature Center Way) were acquired from the Albany Boys Club including 10 acres that were part of Thacher Park but were designated for use by the Albany Boys Club by Emma Treadwell Thacher in 1920.

Finally, On October 18, 1999, Mary Jean Edwards of Guilderland, New York, sold all of the remainder of original Lot 655, the former Stafford farm, to the State of New York for \$250,000.00. Several structures came with the sale of this 148 acre parcel, including an 1800's era two story framed farm house and an old one room schoolhouse with a storage shed. State Parks invested a nominal sum of money to fix up the farmhouse and it is being used for intern housing.

Knox School #5

No plans were considered for the old schoolhouse until 2001 when the Helderberg Kiwanis Club approached State Parks about restoring it to what it looked like when it was last used in the early 1930's. At the time, Parks could not commit resources to the project. The Kiwanis regrouped and decided to ask New York State if they could restore it with some technical assistance from State Parks. Working with Thacher Park, Saratoga Regional administration and Peebles Island Resource Center, the project was approved. From 2003 through 2009, several volunteer work days were scheduled to perform the work. Old wooden desks from the schoolhouse that were stored in the chicken coup of the Edwards property were restored. Grant money, monetary donations and in-kind donations were used to rehabilitate and furnish the schoolhouse. In 2005, Knox School #5 was placed on the National Register of Historic Places. The project was completed in 2009 and a grand opening celebration was hosted on July 11, 2009. In 2011 the Friends of Thacher Park and the Helderberg Kiwanis Club jointly purchased a historical marker for the Schoolhouse. Park staff installed the marker adjacent to the schoolhouse, clearly visible from Albany County Route 256 (Ketcham Road).

Emma Treadwell Thacher Nature Center

In May of 1999, the Schroeder family of East Greenbush gave birth to a new chapter in the history of Thompson's Lake State Park. The Schroeder's gave New York State \$400,000.00 to build a new nature center and an additional \$350,000.00 endowment to underwrite the operation of the center. Fred and Martha Schroeder stipulated the center be built on the site of the old Camp Thacher on the former Albany Boys Club property. Fred Schroeder, an outdoor enthusiast and avid hiker, served for 30 years with the Albany Boys Club and had been the director of

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Camp Thacher. Ground was broken on June 10, 1999 and the Emma Treadwell Thacher Nature Center officially opened its doors on July 17, 2001. Distinguished guests included Governor George Pataki and former Governor Hugh Carey. Today, the nature center continues to fulfill the dream of the Schroeder's to provide an opportunity for families and children to learn and explore the environment and the natural world around them.

Appendix E – Bird Conservation Area Management Guidance Summary

DRAFT Revisions 2013
New York State
Bird Conservation Area Program
Management Guidance Summary

Site Name: John Boyd Thacher/Thompson's Lake BCA

State Ownership and Managing Agency: Office of Parks, Recreation, and Historic Preservation

Location: Albany County, Towns of New Scotland, Guilderland, Berne and Knox.

Size of Area: ~ Approximately 2,453 acres

DEC Region: 4 OPRHP Region: Saratoga-Capital District

General Site Information: The John Boyd Thacher/Thompson's Lake BCA consists of all of two nearly contiguous State Parks in Albany County. John Boyd Thacher sits atop the Helderberg escarpment, a 100 foot high calcareous cliff. Thacher is dominated by forested uplands. The Thompson's Lake Campground area consists of additional upland forest, old fields and a bur oak-black ash swamp adjacent to the lake. The park borders on Thompson's Lake (128 acres), but the lake itself is not owned by OPRHP.

Vision Statement: Recreational opportunities and access will continue in a manner consistent with conservation of the diverse assemblage of bird species using the area for breeding or during migration. The Emma Treadwell Thacher Nature Center and the BCA will serve as an important resource for environmental interpretation and education.

Key BCA Criteria: Migratory bird site, diverse species concentration site; species at risk site (ECL §11-2001, 3. e, f, h). There are 171 species of birds that have been identified within the J.B. Thacher and Thompson's Lake BCA, of which 102 are confirmed or probable breeders, including: Sharp-shinned hawk (Special Concern), Cooper's Hawk (Special Concern), Northern Goshawk (Special Concern) and Golden-winged Warbler (Special Concern). The forests support some of the area's highest densities of breeding songbirds such as Hermit Thrush, Winter Wren, Magnolia, Black-throated Blue, Black-throated Green, Blackburnian, Canada and Worm-eating Warblers and Louisiana and Northern Waterthrushes. J. B. Thacher supported the first recent regional nesting of Common Ravens and is now the nucleus for the population in the area.

Critical Habitat Types: The BCA consists primarily of upland forests of hemlock- northern hardwood, maple-basswood rich mesic, limestone woodland, conifer plantations, and successional northern hardwood communities. Other habitat types found in the BCA include hemlock-hardwood swamp, red maple hardwood swamp, shallow emergent marsh, shrub swamp,

successional old field and successional shrubland communities as well as areas developed for recreation. Significant ecological community types include 3 miles or approximately 50 acres of calcareous cliff community.

As developed recreation at John Boyd Thacher/Thompson's Lake State Park is of a relatively small scale relative to the size of the park and the developed areas are interspersed with forested communities, the entire park will be included within the BCA boundary. It was determined that even the developed portions of the park provide important habitat for birds and should not be excluded from the overall BCA area. However, it is recognized that these areas serve a somewhat different role in supporting local bird populations and receive greater pressures from patron use. Management guidelines specifically designed to balance the use of these areas by patrons as well as the bird community are included.

Operation and Management Considerations:

Management of the BCA will safeguard and enhance populations of wild birds and the habitats that the birds depend upon for breeding, migration, shelter, and sustenance.

- *Identify habitat management activities needed to maintain site as a BCA.*

General Activities:

- Monitor bird predation by human-associated predators, e.g., raccoons and cats. Take steps to control such predation if it becomes a significant threat.
- Monitor and control the spread of invasive species, for the purposes of this MSG, where direct impacts to bird populations are observed. Key species of concern include swallow-wort, oriental bittersweet, bush honeysuckles, buckthorn, emerald ash borer, Asian long-horned beetle, and Eurasian boar.

Forest Communities:

- The large areas of northern hardwood, Maple Basswood Rich Mesic and mixed forests at J. B. Thacher/Thompson's Lake need to be protected from fragmentation and isolation of habitats used by forest interior nesting birds. Any activities that would remove large canopy trees or greatly add to the volume of patron use in these areas should be evaluated on a case-by-case basis.
- Protection of large canopy trees can also address protection of State Special Concern woodland raptors which depend on large undisturbed areas of forest. DEC recommendations include avoidance of any development, cutting, or trails in areas with known nest sites (minimum buffer of 95 m for trail placement, 402 m buffer for larger scale management activities).

Successional Old Field/Shrubland Communities:

- Beaver Dam Rd: Successional old field/shrubland habitat on the south side of Beaver Dam Road should be maintained for Golden-winged Warblers (Special Concern), which have nested there in the past and may continue to do so. Management should focus on a mixture of mostly shrubs with some small openings of grasslands and a few

larger perching trees.

- Thompson's Lake Campground: Successional old field/shrubland in the area near the entrance to the Thompson's Lake Campground, near the entrance to the Nature Center (north and south of Ketcham Rd.) as well as those bordering Nature Center Rd. to the west, have been managed for grassland bird species for several years. These areas were identified for grassland management as part of the WHIP program. Bobolink is a confirmed breeder in this area and the Northern Harrier is a probable breeder. Fields are mowed once yearly after August 1st. This management should continue in these areas.
- Northern Zone: Successional old field/shrubland in the northern zone of Thacher State Park should be maintained primarily for successional old field species in general. Management should focus on maintaining the large open fields while maintaining the shrubland component as a relatively narrow transitional ecotone along the perimeter of the open fields. Fields should be maintained through once yearly mowing after August 1st. Mowing should be conducted in either a back and forth pattern or as concentric circles beginning in the center of the field and working out to the edges so as to avoid trapping any wildlife in the path of the mower.

Calcareous Cliff Communities:

- The limestone cliffs of the Helderberg Escarpment are particularly important for some bird species, particularly ravens. The escarpment cliffs are also one of the major recreational features of the park. While recreation, in general, is not necessarily a negative impact to bird species, recreational activities planned for the area at the top, base, or face of the escarpment cliffs should be reviewed for their potential impacts. Specifically, any activity should be designed so as to avoid direct impacts to raven nests and the surrounding area. Specific recommendations for how much buffering a raven nest should receive from recreational activities will be made on a case-by-case basis. This could also include closure of certain areas of the cliff face to public activities during certain sensitive time periods, especially nesting.

Wetland Communities

- Where feasible, invasive wetland plants such as phragmites australis and purple loosestrife should be managed in favor of native wetland flora, which provides a better food source for wetland birds.

Developed Park Areas

- Most of the managed portions of the Park are still lightly forested with mature trees. Tree removal in managed areas should be kept to the minimum required to protect public safety. Tree removal through the established Hazardous Tree Removal program should ensure that these managed areas continue to play a role in supporting the bird populations common to the Park.
- Many areas that are currently mowed at the park are now mowed less often under the Region's Reduced Mowing Program. Those areas should continue to be mowed once annually, after August 1st so as to provide better habitat through much of the season

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but still maintaining the site in an open, non-forested condition. Additional areas should be identified for inclusion in the program as deemed appropriate by the park and regional staff. Areas currently mowed once annually as part of this program should be assessed to be determined if they should be left un-managed in the future and allowed to revert back to forested land.

- In accordance with the OPRHP tree management policy new development proposals should minimize removal of trees and retain as much natural vegetation as possible to continue to provide bird habitat throughout the park.
- *Identify seasonal sensitivities; adjust routine operations, accordingly.*

Nesting Northern Goshawks (Special Concern) can be very aggressive in defense of their nesting territory. If goshawks nest near trails, the trails may need to be relocated during the nesting period (approx. mid-April to mid-August) to increase nesting success and to protect visitors.

- *Identify State activities or operations that may pose a threat to the critical habitat types identified above; recommend alternatives to existing and future operations, which may pose threats to those habitats.*

There are no State activities or operations that pose a threat to critical habitat types.

- *Identify any existing or potential use impacts; recommend new management strategies to address those impacts.*

State Parks maintains a comprehensive trail system throughout the Park. Any alterations to the system or significant realignment or design of trails will require environmental review to assure that changes are consistent with bird habitat protection. Areas adjacent to designated trails will be monitored. Any adverse impacts to these areas will be remediated. Spread of informal trails off of designated trails will not be allowed.

Education, Outreach, and Research Considerations:

- *Assess current access; recommend enhanced access, if feasible.*

The Parks are open from 8:00 a.m. until dusk. Some parking areas may be closed until 8:00 a.m. Park staff has been cooperative about allowing access for birding outside the normal hours of operation with advance notice.

The Indian Ladder trail, which runs along the base of the escarpment, is only open from May 1 through November 15, conditions permitting.

Most of the area is accessible by foot trails only. Several overlooks are accessible by car.

- *Determine education and outreach needs; recommend strategies and materials.*

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The Emma Treadwell Thacher Nature Center at Thompson's Lake will be a primary facility for interpretation of natural resources at both parks.

Interpretative materials about the diverse bird species will be developed. Update *Birds of John Boyd Thacher & Thompson's Lake State Parks*. Parks will continue partnerships with the Hudson-Mohawk Bird Club and SUNY-Albany on interpretive programs and inventories.

A BCA kiosk will be designed and installed in an appropriate location.

- *Identify research needs; prioritize and recommend specific projects or studies.*

Inventory of bird species is important to establishing a baseline. Periodic inventory will serve as a comparison with this baseline. Monitoring will have a focus on federally and/or state-listed species and measuring levels of diversity. Assess current breeding status of Golden-winged Warbler. Monitor trails for presence of nesting Northern Goshawk.

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Date Designated: 4/26/04

Date Prepared: 6/21/13